

**Project Dissertation Report on**

**PERCEPTION OF E-VEHICLES AMONG  
ENTRY LEVEL CAR SEGMENT BUYERS**

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# **CERTIFICATE**

This is to certify that the dissertation report titled “PERCEPTIION OF E-VEHICLES AMONG ENTRY LEVEL CAR SEGMENT BUYERS ”, is a bonafide work carried out by Mr Ajeet Kumar of MBA 2019-21 and submitted to Delhi School of Management, Delhi Technological University, Bawana Road, Delhi-42 in partial fulfilment of the requirement for the award of the degree of Master of Business Administration.

**Signature of Guide**

**Signature of HOD (DSM)**

Place:

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Date:

## **Declaration**

I, Ajeet Kumar, student of MBA 2019-21 of Delhi School of Management, Delhi Technological University, Bawana Road, Delhi – 42, hereby declare that the dissertation report “Perception of e-vehicles among entry level car segment buyers” submitted in partial fulfilment of Degree of Master of Business Administration is the original work conducted by me.

The information and data given in the report is authentic to the best of my knowledge.

This report is not being submitted to any other University, for award of any other Degree, Diploma or Fellowship.

PLACE:

AJEET KUMAR

DATE:

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Ajeet Kumar

## **Abstract**

In today's world environment concern is on every nation problem and main reason behind the environment problem is carbon emission which mainly spread our atmosphere from vehicles. Now to find the solution of this problem scientists invent electric vehicles which has no use of any kind of fuel. This vehicle has lithium-ion battery which is rechargeable without harm the environment.

In this article we can study about perception of electric vehicles in Indian market. Study of various factors which help to know the perception of Indian customers about electric vehicles. Various factors that influence the purchase decision of car buyers are individual perception on dimensions like environmental issues, cost, trust, technology advancement, infrastructure, and society acceptance. The results shows that environmental concerns and consumer trust on technology are antecedent factor for perception about Electric vehicle purchase and the factors which give adoption blow back are cost, infrastructure, social acceptance.

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# **Introduction**

## **1.1 Background**

For the ultimate two times decades, the worries for the prevention of the surroundings throughout all ranges of the society have prompted a remarkably enhance withinside the quantum of objects showcased as green goods. Customers aren't handiest turning into greater aware however also are worried for the environmental problems and feature found out that majority of problems main to....environmental devastation are a right away end result of elevated populace and human intervention throughout with the intake sample dominating via way of means of generation development.

These environmental touchy consumers are actually getting ready to update mainstream merchandise via way of means of green objects which have a sizeable impact at the surroundings those modified behaviour and developing possibilities of patron for eco-pleasant merchandise have a sizeable final results at the company international too. In region of this, now no longer handiest the authorities however additionally the large company homes have now started with projects on environmental problems in more than one numbers of methods via way of means of knowledge the evolving wishes of turning into inexperienced via way of means of adopting inexperienced behaviour. Extensive dependence on fossil fuel-primarily based totally automobiles because the number one version for delivery has raised severe environmental worries. Only vehicular pollutants is accounting for approximately fifty one percentage of pollutants of air in India wherein as, in metropolitan areas. Thus, the modern wave of environmental 1st emphasizes the reputation of electrical vehicle (EV) as an change to fossil fuel-primarily based totally conventional automobiles, as a brief degree to lessen the negative impact of vehicular pollutants.

## **1.2 Problem statement**

The GOI has declared that it'll now no longer go away any stone unturned to shift all automobile enterprise in India to EVs with the aid of using 2030. EV has now no longer worthwhile large known amongst clients withinside the past. However, the current generation upliftments, particularly withinside the subject of battery-operated generation, have made EVs an amazing alternative for the purchasers.

EVs have began out getting into the auto marketplace in lots of towns in India. However, massive scale deployment of EVs in India calls for a better diploma of cognizance and approval. factor of view from its goal clients from wherein the need of this paper comes in. Through this study, an endeavour has been made to figuring out and reading factors describing customer obtaining of green EVs. The cutting-edge state of affairs of changed. customer course along side multiplied know-how approximately the environmental associated topics has given hike to a inexperienced marketplace wherein customers with their high-quality mentality closer to green objects will circulate their alternatives from darker companions to inexperienced things. Even though purchasers have a strong decision to apply green objects, they're now inclined to surrender their alternatives, transfer to the inexperienced objects and also are organized to pay a top rate for it. Various researchers and academicians had been additionally energizing to analyze the continuing rage withinside the

acting law of inexperienced marketing. The gift paper is an attempt to analyze the advocacy moves of purchasers closer to environmental pleasant objects.

### **1.3 Objective of the study**

Growing concept of customers adoption movements closer to EV is critical for both environmentally and managerially causing. From an environmentally outlook, the developing mission of EVs will decrease the terrible consequences of automobiles primarily based totally on fossil fuel, and on this way, it'll make a contribution to pleasurable most of the desires proposed through the international community. From a low-budget and buying and selling viewpoint, the alteration and production of the environmental pleasant objects aren't going to be fruitful with out clients expressing enthausiam or preference to simply accept it. As maximum of the older studies focused their statement at the a part of environmental factor of view, ecological bother, culture alethics, behavioural variables and psychographic variables in casting clients' movements approximately environment-pleasant objects in FMCG and different long-lasting objects, a stable want become detected to address the cutting-edge take a look at to exmaine many aspects of clients movements closer to EVs in Delhi, that's one of the maximum polluted towns withinside the world. This mission focused handiest at the appropriation dedication of personal vehicle customers, because the assumption of EVs in corporations may be expressed as a method require numerous people with exceptional jobs. Ahead of time take a look at on EV adoption in vending acrobatic assemble that vehicle customers and backbone producer use different foundation whilst estimating EVs. It become additionally installation that vending mission of EV is basically regulate through its effectiveness and accomplishment, whilst unbiased preference producer fee the hobby of EVs for the environment.

### **1.4 Scope of the Study:**

The main focus of this research was the Perception of e-vehicles among entry level car segment buyers for intermittent demand for industrial warehouses & supply chain fields to predict the upcoming demand accurately so that they can plan their inventories & order levels efficiently.

In this research, we take various factors into consideration to maximizing efficiency. Factors include data patterns i.e frequency of demand & size of the demand which gives us a type of demand and how fast it is moving.

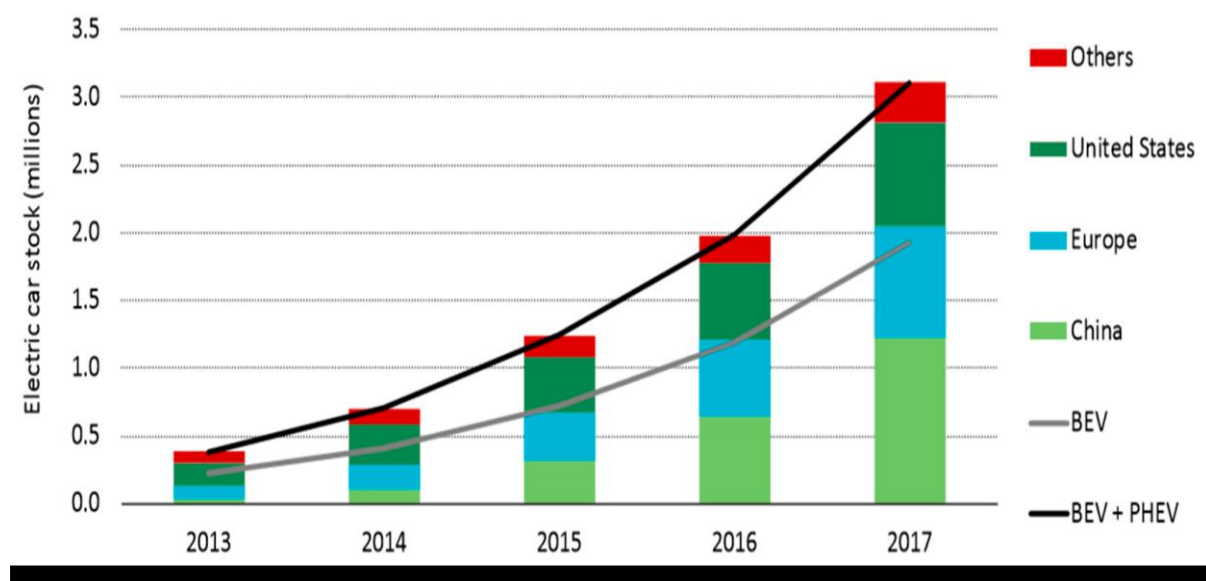
Demand has been classified based on its patterns because few items need not necessarily follow the particular pattern so those items should never be predicted.



## 2. Literature Review

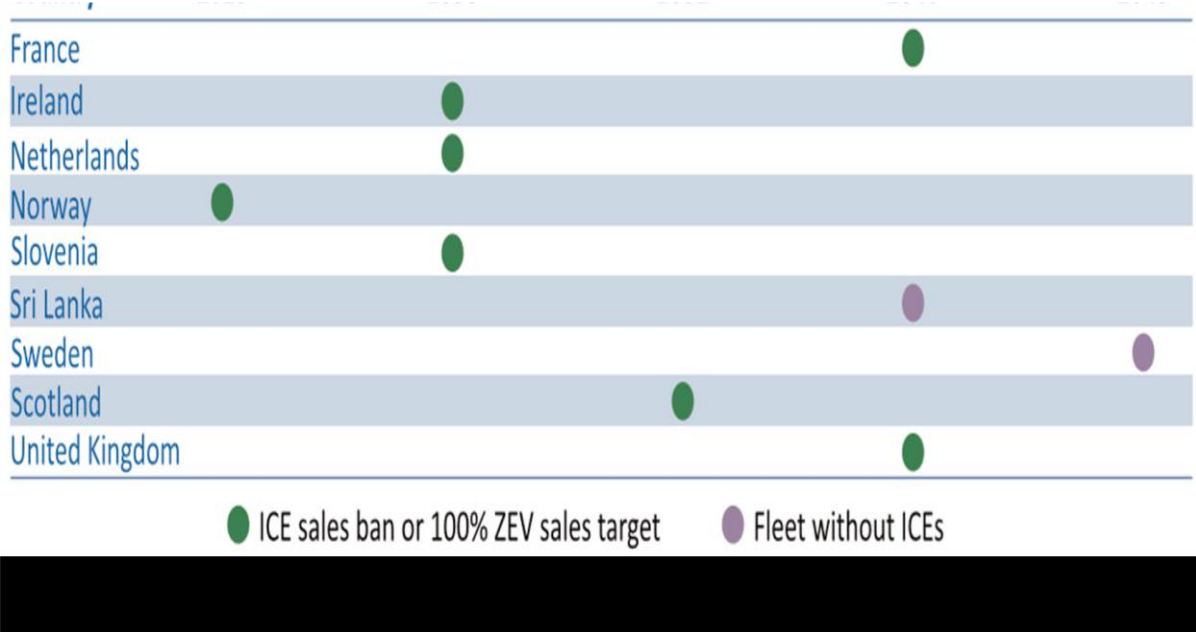
### 2.1 Development of Electric Vehicles

According to mathematical records from the IEA (International Energy Agency) in 2018, about 2.2 million EV have been offered in 2017, which show off a 54% upward push from 2016. In insertion, after the global income quantity of EV passed 1.5 million in 2015 and 2.5 million in 2016, the worldwide percentage of EV in 2017 overstep 320 million, which specific a 55% upward push from 2016, and China ranked 1st with a 39% marketplace percentage.



**Figure 1.** Evolution of world electric powered automobile stock, 2013–2017 (IEA, 2018).

The EV 30@30 motion became instituted on the Eighth Clean Energy Ministerial in 2017, with the aim of decorate the marketplace length of EV in all of the instituted nations of EVI (Electric Vehicles Initiative) to 30% via way of means of 2030. The provocation includes accomplishing upgradation withinside the international ownership of EV, the upgradation of related battery manufacture technological and count number prerequisite, the location of charging infrastructure for EV, power and gasoline protection, the depletion of greenhouse gases emissions and different elements worthwhile for longevity. With this framework, greater governments are drafting improvement goals associated with EVs, carry greater clean symptoms and symptoms to automobile manufacturers and different collaborator, and increase prerequisite, Sustainability 2019, 11, 3863 four of twenty-two their believe withinside the destiny method foundation. In addition, a few countries have introduced method to prohibit inner combustion engine automobiles, which marks an fundamental step withinside the upgradation of EV.



**Figure 2.** Announced income bans for inner combustion engine (ICE) vehicles

In addition to authorities strategies, international automobile producer have additionally make stronger the upgradation of the EV enterprise with real steps. By 2018, nearly all of the top automobile producer round the arena had carry their intension or approach to improve EV. In Feb 2017, Daimler AG announce that withinside the future, the Smarter will cognizance on EVs withinside the USA and Canada vehicle mobile sector. In July 2017, VOLVO introduced that it's going to most effective manufacture pure EV and hybrid EV from 2019. In 2016, HONDA announce that via way of means of 2030, 2/three of the company's car income may be EV. Toyota additionally announce that it's going to forestall promoting diesel car in Europe via way of means of the stop of 2018. Due to the flourishing expansion of the EV industry, in latest years, scientists in China and overseas have paid greater attentiveness to shopping for behaviours and goal associated with EV. In the 4<sup>th</sup> sector of 2011, the Germany RWE Group located 6501 purchasers from 13 international vehicle mobile fields, 503 of whom had been from China. Research suggests that China purchasers may be the 2<sup>nd</sup> one maximum inclined to shop for EVs after Indian purchasers. The foremost surveyed inspecting for forty percent of purchasers' shopping for of EV is power safety and environmental conservation. The maximum enormous examine for clients is automobile charging . Although authorities subsidies can Driven via way of means of authorities policies, the EV marketplace has developed promptly in China due to the fact that 2011, making China the arena's biggest EV marketplace. The income capability of EV continues expanding, however the marketplace seize of EV continues to be very low. In 2017, the marketplace seize of EV in China changed into most effective 2.8 percent.

## **2.2 Level 2 Charging System for Electric Vehicles**

Charging stations for Electric Vehicle is an important aspect thought which it will more popular and first choice among consumers. For sustainable development and cost effective of Electric Vehicle for people Level 2 charging system is most factor for future generation development.

The commercialized improvement and speedy rapid of electrified transportation shape, i.e. EVs and plug-in hybrid-electric powered vehicles (PHEVs) necessitate the rapid, real and inexpensive EV deliver equipment (EVSE) infrastructure (i.e. Electric Vehicle chargers). As a be counted of fact, EVs are the finest addition of ICEVs because of their power green and surroundings pleasant naturally. But their global acquisition has investigate through the insufficient changing infrastructure withinside the globe. The paintings represented on this studies proves country of the artwork evaluation of Level 2 changing technological for Electric Vehicles and their appropriate deployment, component, and requirements to be had withinside the open literature, in addition to possible grid interplay and ability protection actions. The manuscript additionally forecasts absolutely an inexpensive imaginative and prescient of the modern position, monetary evaluation, electricity marketplace operation and manage and protecting functions of EVSE to evaluate the market feasibility of Level 2 changing shape. The paintings can be extraordinarily useful to scientists on this field, enterprise personals, and expenditure representation and class as a geared up advice of the changing shape of EVs, with information on vital functions and pleasant of EV changing shape.

### **2.2.1 Business Models for EV Charging Station**

A running version defines the manner wherein objects or help are brings, include outermost conceiving of ethics layout of positive objects or offerings for an end-consumer consumer. It hurries up the origination of EVs into the non-public zone of transportation shape. It is essentially easy to estimate through spend deliberated thoughts on threats and possibilities as it's far inner 1 to 1 unmarried agent. We are at gift looking a seperation in extraordinary commercial enterprise shape for the economic consumer of charging station designed and normal to the non-public EV consumers. A particular commercial enterprise shape have to additionally formulate a version of clever and coordinated charging control for EV fleet via cloud-primarily based totally Charging Management System.

### **2.2.2 Free EV Charging Stations**

In spite of the measuring that required directional investing thru a municipality forum, there are also severa controlled parameters that yield lots much reduced affect on public budgets. The first-class standard is free Electric Vehicle parking at city spaces. To lure clients to few of its branch shops, assets developers and real belongings organization offered free Electric Vehicle changing at few of locations. Similarly, e.g. Electric Vehicle producer Mahindra Reva in India has a agreement with the Gopalan chain of branch shops to set-up free changing elements at its retailed spaces. Often, there can be a trouble of automobiles vain parking on the once spotted in the absence of changing the automobiles as parking spaces are public assets. One member stated that authentically fifty percent Electric Vehicles occupying

the changing spots for best parking motive, and they may be definitely changing their cars withinside the direction of the night time hours at home.

### **2.2.3 Regulated charges for Charging**

A set of hints, i.e. authoritative options are carried out to give an explanation for the responsibilities of the electric strength business enterprise stores, in rolled out public changing infrastructure. Obviously, it is determining and managing via the nice kind of changing station holding stores and or characteristic in step with earlier defining regulator assumptions. The definition moreover covered the investing restoration hints and remuneration of the provided provider hints. In the summer season season of 2017, Tata Power launching Mumbai's 1<sup>st</sup> enterprise EV charging station , with customers paying costs set via the Maharashtra Electricity Regulatory Commission. Reliance, each different private strength developer, is also cited to be looked at the EV changing market.

### **2.2.4 Reassess EV Charging Network**

In India, DISCOM Maharashtra Power Company is seeking to used its substation in top Mumbai and Pune places as EV changing station spots. In a signal of the challenges, the economic marketplace offers excessive prices led DISCOM Bangalore Electricity Supply Co to reconsider plans to set-up a clever grid to offer an Electric Vehicle changing community withinside the city.

### **2.2.5 Community Charging Spots**

An natural begining meant to proliferate changing spots past town limiting as a result contributing to the environment with a view to permit Electric Vehicle used to flourishing. Many groups are related to the grid and 15 Amp stage 2 sockets are not unusualplace in growing nations like India. The concept is for groups and businesses positioned among forty and 70 kilometer round towns to set-up 15-ampere changing spots. The goal is to permit city EV proprietors to increase the variety in their trips through supplying out-of-city changing. There is presently 222 network changing spots withinside the country, a few supplying loose changing as an incentive to draw traffic at motels and malls, for instance, others perform on a industrial foundation with clients pay to fee their cars. The 15 Amp spot provide slower changing instances than the extent three DC systems, provided at maximum town- middle changing spots.

### **2.2.6 Battery Swapping Spots**

The lengthy changing time required with the aid of using the EV batteries ought to correctly be removed with the aid of using sleek attractiveness of battery swapping stations (BSS) . These are the mediating spots among the clients and strength machine firms. A usual enterprise and running version is obligatory for the a hit displacement of those kind of spots, that will, except offering a quick and constant battery changing substitute, permit it making a

revenue-producing spots. The maximum high priced detail is the battery used within the automobile as garage, with the price will increase substantially as garage capability growth. Affordable means that and 3-wheel motors account for eighty percent e.g. in Indian home automobile sales. The BSS have to make sure the customers to have enough variety with the aid of using letting them switch low battery for completely charged ones en-route. The community of BSS, like the ones for Electric Vehicle changing spots, is expected to broaden some of enterprise structure. To made the most of the BSS, it have to take part within the marketplace as a carrier company within the shape of power garage, call for reaction, and retain. The trouble of right programming garage functionality of the BSS may be viable address with the aid of using time-various strength prices, i.e. a idea of real-time pricing (RTP). The low fee duration of the day may be exploited to maximise earnings with the aid of using changing the battery and buying the strength in Grid-to-Battery mode (G2B) and promoting the saved power in high-fee intervals in Battery-to-Grid mode (B2G). Moreover, BSS can perform in Battery-to- Battery (B2B) mode i.e. changing sure batteries with the aid of using offering the identical power this is saved in different batteries shape G2B mode.

### **2.2.7 Successful EV Charging Infrastructure Deployment Program**

Successful development in EV charging infrastructure faces a few difficult, and once in a while opposite, consideration in phrases of enterprise structure (loose or sales geenrate), user (mass transit or non-public Electric Vehicle owner), type (battery swap, network charger or high-velocity supercharger), strength source (grid, sun or a micro grid controlled hybrid) etc. The precept of a enterprise version is to outline the approach through which the company provides price to clients, invitations the clients to pay for price, and converts the ones bills to profit. Ensuring the proper transport associate is valuable to success, so it's far really well worth right here to say the above-indexed factors to have an excellent perception into making plans a selected project:

- **Business version:** Choose a associate with revel in of handing over Electric Vehicle changing applications for all enterprise structure. They could be first-class positioned to apprehend what's require to satisfy your unique aims.
- **User:** Virtually each element of mass transition changing infrastructural will fluctuate from that for non-public Electric Vehicle owners. Be positive your associate has revel in developing each – so can extract upon first-class exercise from a lot of sources.
- **Type:** Not best will the changing generation fluctuate throughout sorts of stations. Planning, permitting, layout and creation wishes may also vary. You want a associate who can display revel in in each element of the design.
- **Power source:** Electric Vehicle initiatives up or down at the honesty of the strength deliver. So you want select a associate with giant information in each strength technology and strength deliver initiatives – from each grid and renewable sources – and the verified can potential to combine them into an Electric Vehicle changing spots
- **Finally,** the first-class associate could be one with revel in in each element of an EV charging applications lifecycle: from idea via to asset management. This could be the associate first-class capable of supply most price from each element of setup.

### **2.2.8 Power Market Operation in Smart Grid Environment**

Vital feature of the smart Grid is to make use of the set up producing ability in a greater higher and smart way. To reap this, a different strength price device offer a choice to customers to move from excessive call for durations to low call for durations. And offer the capacity for remotely screen components on and stale to control call for regionally with the aid of using advantages. The layout and operational of changing spots could be therefore need. A marketplace is an area wherein a surroundings for call for and deliver is found out i.e. shopping for and promoting a sure product or service. Consequently, markets for power or strength, ancillary offerings and so forth. The guidelines with the aid of using which this buying and selling platform functions, therefore, is defined with the aid of using a marketplace model. In the electric strength device, the marketplace by hook or by crook differs from regulatory options. Charging infrastructure and verbal exchange necessities for the on board price controller and the power management controller could basically be ruled with the aid of using the character of get entry to the changing spot, i.e. non-public or public. Electric Vehicle and PHEV changing factors may be relatively massive load withinside the current strength grid. If it's far unmanaged, the bad impact may be at the strength grid, therefore, it's far important to observe the effect of Electric Vehicles at the strength grid as proven in. An evaluation to research today's strength device integration with Electric Vehicles is proven in.

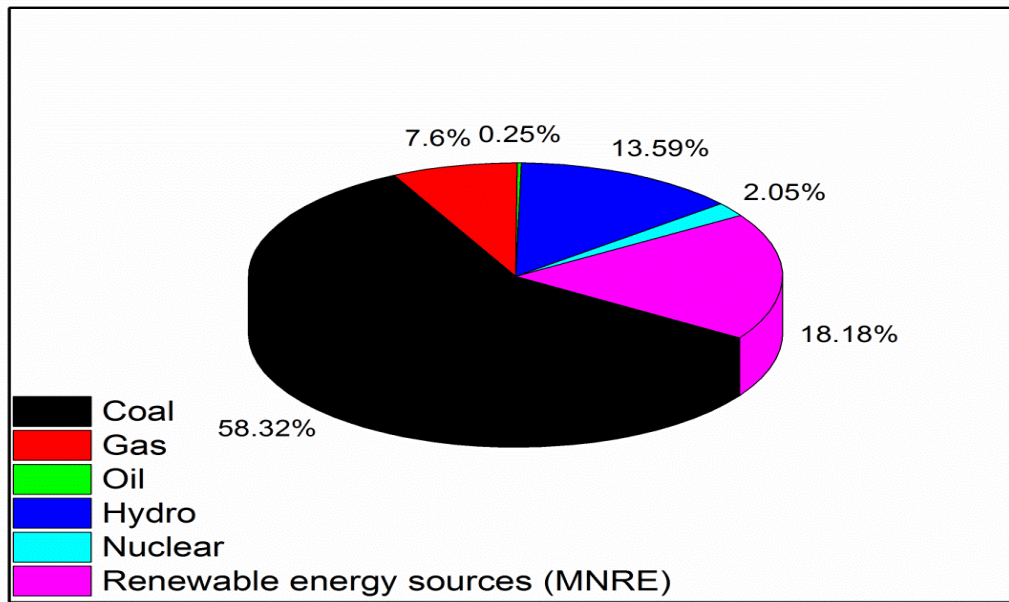
### **2.2.9 Cloud Communication Interfaced IoT Architecture**

Communique gadget is a key detail of the clever grid infrastructure. And one of the vital advantages for the recognition of EVs in clever grid is the capacity to behave as stabilized additives thru bi-directional changing units, thereby knocking down the nearby or international peaks. Also, the imbalances, defined in, via way of means of focusing an vital open rate factor protocol (OCPP) shape protection factor. The Figure four interfaces, while offers with cloud communique surroundings contain diverse wi-fi sensor networks (WSNs). WSN is described via way of means of a huge variety of sensor nodes with constrained strength abilities which are placed random or resolute in a selected surroundings. WSNs are initiate the important thing additives, and vital technology of the Internet of Things (IoT) and Cyber-Physical Systems (CPSs). Internet of Things (IoT), implies the community-primarily based totally interconnection of often practising entities. It hyperlinks with the wi-fi community thru the interface via way of means of the sensors, digital qualifer, two-dimensional codes etc. Here WSNs will play a tremendous position in diverse software situations of the destiny net, consisting of surroundings surveillance, health care, army battle fronts, agriculture observing, commercial direct, and clever life. The IoT generation facilitates gain the communique among guy and system or system to system. Three key functions of IoT are considerable, wise and net connectivity. Basically, there are 4 functions in IoT: a meeting of data, reciprocal communique, dealing with and reaction control.

## **2.3 Indirect Carbon Emissions and Energy Consumption Model for Electric Vehicles: Indian Scenario**

This have a look at suggests that the creation of E-automobiles to lessen the effect of car emissions at the surroundings is absolutely depending on the electricity blend for strength technology withinside the charging location. Scenario evaluation is performed with the aid of using thinking about the Indian electricity blend state of affairs and the effects confirmed that with the existing electricity blend in country, E-automobiles will manufacture greater oblique carbon emissions in comparison to inner combustion engines. In state of affairs 3, in which the electricity blend as in keeping with the imaginative and prescient 2022 of the Indian authorities became taken into consideration for assessment of equal of carbon emissions, it became discovered that the emissions from Electric-automobiles are decrease than that of the IC automobiles. Hence begining have to be taken with the aid of using the policymakers to enhance the percentage of renewable electricity reassets for strength technology previous to the creation of Electric-automobiles. Other thing influencing the social recognition of the electrical automobile is its electricity intake sample and decrease using variety. An electricity intake SIMULINK version for the electrical automobile became additionally evolved on this have a look at with the aid of using thinking about the street slope and automobile using sample as enter parameters. The evolved Simulink version became examined for 3 unique using situations. In the primary take a look at cycle with flat street situations at regular speed, it became discovered that the electricity intake is immediately proportional to the velocity of the automobile. In order to validate the evolved version with a longtime using cycle, EUDC cycle became taken into consideration withinside the 2d take a look at. The effects of simulation for EUDC cycle additionally confirmed that the electricity ate up with the aid of using the automobile will growth with the growing street slope situations. And the using variety for the automobile in EUDC take a look at cycle at 0 slope became discovered to be 165km, that is near the using variety furnished with the aid of using the manufacturer. Real street slope situations for a quick stretch of 8.5km from Nanda ki chowki to Bidholi had been taken into consideration withinside the 1/3 case and the effects confirmed that the using variety of the automobile became decreased to ninety five km. Hence this SIMULINK version could be beneficial for the policymakers and production organizations to layout the electricity intake sample of the electrical automobile relying on the street slope and using circumstance in order that the charging stations may be positioned at strategic locations, with a view to additionally enhance the social recognition of the E-automobile.

**Share of power reassets for the strength technology in India (Ministry of Power, India)**



Indian Scenario is distinctive because the present day marketplace percentage of Electric Vehicle is round 0.1 percent. A gift nearly, all automobiles depends on fossil fuel-primarily grounds totally transport. These pollutant in ecosystem through greenhouse gases emission & reasons worldwide rise of temperature. Transportation of Indian region is developing very rapid. The hole among home crude oil manufacturing and intake is broadening. Rustic India which imports round 70% of oil need in keeping with year. Therefore it may be pressing want to research elements and demanding situations for the improvement of reliable and smooth options systems of transportation.

The populace is greater and high emission. India stands one/3 with the greenhouse gas emission of 1.726 billion Mt. the top ten emitting nations account for nearly common fraction of the arena greenhouse gas emissions. Hence there is pressing wish to cognizance nearer to Electric Vehicle era that has practicality nearer to zero emission for property transport system. Additionally, owing to urbanization and decentralization of metropolis space, a quick growth in camera cars has been determined. The transportation space is anticipated to develop around multiple over the subsequent four decades, pushed through growing uptake as earning rise that's a project in elements of traffic, infrastructure of street etc. wanting into the expansion, the fashionable stage of pollutants and degrading of fuel, there's strong wish to shift from Ancient IC engine automobile nearer to the electrifying automobile. At moment involve for work units in Asian nation is pretty little. By enterprise approximates, a lot of but five-hitter of the traveller vehicle marketplace in Asian nation may contain of electrical.

Cars over the subsequent 5–7 years; at 1,75,000 units. Presently, the motors offered in Asian country square measure electrical high-powered motors (EV), Hybrid Electric Vehicle (HEV) and Plug-in Hybrid Electric Vehicle (PHEV). But electric powered motors sale isn't always very promising no matter EV/HEV/PHEV may be greater useful for Indian street because of following reasons



1. Electric or hybrid powered powertrains perform at a lot better performance at low Indian riding speeds than an Interior Combustion Engine (ICE).
2. A higher proportion of strength consistent with Indian ride is misplaced in decelerating, which is nearly recovered in a hybrid-electric powered automobile (HEV) and EV (Regenerative braking).
3. Hybrid Electric Vehicles and Electric Vehicles use no gas for the duration of wasting and the proportion of wasting time in site visitors is a lot better in India as compare to the U.S. & Europe.
4. 4. Usually common variety travelling in India is a lot fewer than withinside the Europe & USA and Europe, producing Electric Vehicles a lot greater possible and without a variety trouble with a unattached charged.
5. Automobile distance and use– Cycle riding in urban styles have a common begin and stop, excessive site visitors advantages to offer excessive performance via way of means of electric powered automobile.

### **2.3.1 Indian Government Initiative**

Indian authorities has took an initiative & claim the National Mission for Electrical Mobility (NMEM2020). The National Mission for Electrical Mobility (NMEM) has its interrelated key objectives:

1. National power security
2. Extension of home production competencies in complete variety of electrical automobile technologies

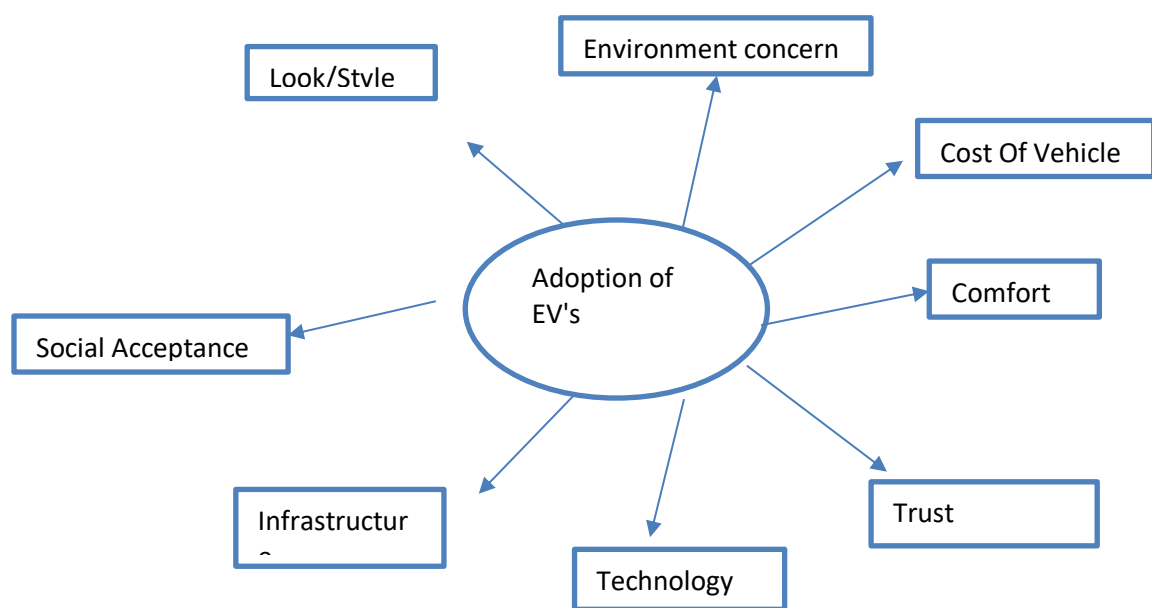
The heavy industries ministry in 2012 undraped its formidable proposed motion plan for Electrical portability 2020, which goals nearly seven million motors on the street with the aid of using 2020. With imaginative and prescient to inspire reliable, cheap and green XEVs (all form of electric motors) that meet customer overall performance and rate expectancies thru authority –collaboration of Industry for improvement and merchandising of India’s production competencies, infrastructure required, customer technology and attention.

#### **2.3.1.1 Initiative of Indian Government towards EV**

1. 2015 FAME India-Faster Adoption and Manufacturing of (Hybrid and Electric) Vehicles in India
2. 2014 Member Country of Electrical Vehicle Initiative
3. 2013 National Electric Mobility Mission Plan 2020
4. 2011 National Mission on Electric Mobility

Thereby supporting India to turn out to be a pacesetter withinside the XEV two-wheeler and four-wheeler marketplace withinside the international with the aid of using 2020, with general XEV income of 7 million gadgets consequently permitting India’s car market to acquire international Electric Vehicle production management and contributing toward National gasoline protection with goal of 400,000 passenger battery electric powered cars (BEVs) with the aid of using 2020~warding off a hundred and twenty million barrels of oil and four million lots ofCO2 which will decrease car emissions with the aid of using 1.three percentage with the aid of using 2020. The general funding required is INR 20,000–23,000 Cr. There is a gradual development as such until now, however, after the assertion of FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles), there may be little push. Linking FAME India and Make in India there may be desire that there may be the quicker adoption of EV in India as it's far a want of an hour. Under the important scheme, a subsidy of INR 1,800 to INR 22,000 is obtainable to two-wheelers, INR 11,000 to INR 1.38 lakh to cars, INR 13,000 for slight hybrids.

### Factors influencing the adoption of Electric Vehicles in India



To alternate consistent with the want of today's global electric powered automobiles are essential to guard the surroundings associated hassle Year 2017 is revolution in Indian vehicle marketplace which introduces electric powered automobile that's first-rate opportunity of gas vehicles for instance Tata Nexon EV which alternate the phase of electrical automobile in Indian vehicle marketplace call for earlier than that Hundai kona that's first electric powered automobile of India's sedan phase automobile

This will take place because of professional and semiskilled generation base of India which give less expensive labour and Infrastructure to begin operation in India. Here to examine the Commercial achievement and buy goal of complete electric powered automobile through Indians, there may be a want to examine the elements influencing the patron popularity of those motors. Various elements that have an impact on the acquisition choice of automobile shoppers are state of affairs like regulatory environment, private modern mental elements, like attitude, belief, and society popularity and attention levels. "Although a few empirical research of the patron popularity of hybrid motors had been conducted, there may be little studies that considers the belief of an predicted state of affairs; in particular, there was little interest at the belief of complete electric powered motors". From Environmental perspective, growth in excessive CO2-emissions and depletion of Fossil reserves , the roll out of Electric automobile may be perceived as a protection degree and destiny security(Neumann et al 2010).

Adoption of any Innovation with the aid of using customers is primarily based totally on attention and notion concerning the transformation. The composition evaluate indicates that the notion and acquiring of Electrical cars in diverse elements of the arena is thoughtful with the aid of using that specialize in decreasing greenhouse gases emission, era (Speed, distance, efficiency), cost (Fuel and Electric Vehicle), architecture (charging spots) and accepted socially. The present analytics have a look at centered on adoption and approach of Electrical Vehicle in country with the aid of using evaluating the features, reliability, acceptance and use of conventional vehicles with future Electrical cars. It might assist in development and that is the maximum applicable subject matter for cutting-edge India. This have a look at allows to recognize and discover the riding parameters that could cause extrade in adoption of electrical car in converting Indian ideologies.

## **2.4 India's Roadmap to Sell Only Electric Vehicles by 2030**

Expanding the producing are the important thing elements of roadmap of India to promote simplest electrical powered cars through 2030. The execution has been divided into 3 parts.

1. In section 1, intention is to seize possibilities which can be already economic, at the same time as making ready for strategic alternatives with the intention to be feasible in close to expectation. This includes constructing the transportation framework. This framework consists of each software program policy and the bodily on call for shipping cars.
2. The 2 section includes enhancing and scaling upon the movements endorsed withinside the first section, at the same time as motivate to involvement from non-public firms. The intention of this section is to put in a gadget-extensive portability result.
3. The 3 section integrates strength with the gadget of transit and allows electrical powered cars to discharge strength to the grid. All the authorities incitement too might be phased out at this step. Presently, the authorities is running closer to regulations for diverse incentives for ownership of the 2 and 4 wheelers, and for the towns which have better Electric Vehicle penetration.

Electric Vehicle adoption is driven with the helpful resource of the usage of buyer incentives , restrictive motivation and generation preparedness. The projected insurance structure initiate severa motion things to push technological transformation withinside the case of quality innovation, suggests severa government duties to integrate the disintegrate info, and holds that a agile of electrical vehicles is with out issue attended in Bharat as a extreme proportion of the population will no longer terribly personal a automobile.

#### **2.4.1 Electric Vehicle Adoption and Air Pollution**

This part provides a assessment of casestudy analysis and simulations on net air superior result of growing electrical hopped-up cars and power technology in varied parts of the planet. Studies withinside the India and U.S. have tested that electrical hopped-up cars assist in lowering air waste emissions and greenhouse gas emissions withinside the while if the progressive load is volumed via non-emitting technology. Largest PM discount thanks to shift to electrical hopped-up cars happens in town areas. shift all traveller cars to electrical hopped-up cars with out changing the electricity mix in Yangtze River Delta place of China would possibly reduce Roman deity, PM 2.5 and unstable natural compound (VOC) via means of suggests that of 10 %, 0.2% and 7.8% severally, but boom SO2 via means of suggests that of three.5%. A alternate withinside the electricity mix toward a lot of less carbon thorough energy technology reassets can additionally reduce air pollutants. In capital of Spain and port four-hundredth electron volt conversion have to be compelled to evoke bigger than 10 5% discount in Roman deity, but might have affected result on PM10 and PM2.5, and no boom in electrical hopped-up technology emissions. In Taiwan, 100 percent electron volt penetration in conjunction with all additional energy returning from thermal energy vegetation will reduce CO, VOCs, NOx, O3 and PM2.five pollutants via means of suggests that of eighty fifth, 79%, seven-membered (internet), 39% and 7.2% severally, when growing SO2 via means of suggests that of 11 November . In Belgium, whereby nuclear electricity may be a huge proportion of power mix, EVs might have a decrease existence for emissions of cycle of greenhouse gas, SO2, Roman deity and PM as compared to gasoline and diesel cars. primarily based at the higher

than, it's able to be finished that adoption of electrical cars reduces air pollutants for max of the emissions. bigger the proportion of renewable electricity within the facility mix, additional is that the discount in air pollutants. Thus, a place's electricity mix regulates the depth of pollutants of air discount thanks to shift to electric hopped-up cars during a place. However, as visible higher than, just in case of fossil gas based totally technology structure, SO<sub>2</sub> is one amongst the emissions which will increase with increased adoption of electrical cars.

#### **2.4.2 India's Energy Mix**

India's presently established capability of 260 GW is based totally on fossil gas primarily depends totally & despite the fact that India's top call for is handiest one hundred forty GW, numerous elements of the U.S. do now no longer have get right of entry to strength common interruption. India additionally has 10,000 GW and 2000 GW of wind and sun capability. The cutting-edge Indian authorities has set an formidable renewable electricity improvement purpose of putting in a hundred GW of sun energy and forty GW of wind energy, respectively, via way of means of 2023. If efficaciously carry out, India's electricity blend can be converted with extra than 25% of the electricity coming from renewable reassets via way of means of 2023. By 2030, India's 50 percent strength can be generate from renewable reassets. In this type of future, air nice effect of switching to electrical hopped-up automobiles will boom immensely because the strength for changing the batteries can be generate from non-fossil gas primarily based totally reassets.

#### **2.4.3 Industrial Systems Dynamic Influences**

Market will play a massive function on imposing India's imaginative and prescient of 100% Electric Vehicles with the aid of using 2030. While numerous new markets could be created, numerous dominant markets, inclusive of gas and oil, will go through. Transportation optimizing innovation, generation improvements & call for decrease batteries costs become force maximum of the transformation whilst imposing portability as a provider. Businesses for Lithium extraction, and production of batteries should mature to make sure reasonably-priced deliver of batteries. Electricity call for will boom because of elevated quantity of electrical motors at the road. Right now petrol and diesel are without difficulty to be had at pumping stations, however in a rustic in which strength outages are common, electric powered car can be deemed an unreliable supply of transportation. Hence dependable power is important for making sure excellent provider from electric powered car. India does have formidable desires for putting in new power era capacity, basically sustainable. Presently, sustainable electricity era businesses are being given numerous grants however sustainable electricity want to be worthwhile for dependable and sustainable deliver of power. With boom in wind farm and photovoltaic (PV) installations, nearby environment might also additionally go through adversely inflicting in addition ecological imbalance. Vehicle variety is taken into consideration one in all the most important limitations stopping adoption of electrical motors. Thus, electric powered car charging stations will want to be hooked up at numerous locations. The largest effect of electrical car though, could be because of boom in extraction of lithium and elevated battery production.

#### **2.4.4 Environmental Impact of Increasing Use of Lithium Batteries**

Batteries of lithium ion are the maximum not unusual place kinds of batteries presently getting used for electric powered vehicles. Increasing call for for electrical powered automobile will boom of lithium batteries, and lithium production primarily based on batteries. There will be boom on extraction of lithium, but as much only 1% of lithium may be recycled in present time. It is pictured that close to four-hundredth Li could also be reusable in 2050 but the non-recyclable Li may have unfavorable impact at the atmosphere. Lithium mining also will be restrained in positive regions owing to social or environmental troubles encompassing the style of metallic extraction of Lithium. the assembly manner for metallic element completely totally batteries too reasons air pollutants but as this pollutants is caused at production sites, which could be usually placed away from the densely inhabited regions during which organic compound completely} totally vehicles motive pollutants nowadays, the web air pollutants withinside the geographic area decreases. a far less polluting battery production manner is unreal in future, additionally lowering air pollutants. however if a pollutants lowering battery production manner is not unreal in future, air pollutants owing to this way might also find yourself Associate in Nursing environmental concern. Also, as a result of the exhaust from this way is emitted via excessive stacks, those gases might also motive an impact this is often one-of-a-kind from what we're accustomed seeing nowadays.

#### **2.4.5 Better than Lithium Ion batteries, this innovation runs on water, air, aluminum and grapheme**

Addressing these types of concerns, a Bengaluru-primarily based totally nanotechnology corporation specialising in Graphene referred to as Log nine Materials have advanced their very own logo of aluminium gasoline cells (AFCs) that provide 5 instances the variety than a mean lithium ion battery can provide, expenses 30 in line with cent cheaper, is less complicated to apply and doesn't require the trouble of continuously recharging it. "The key distinction among say a lithium ion battery and AFC is that the previous is a garage tool which calls for ordinary charging even as the latter is a natural strength era tool. Hence, our AFCs are extra in song with the behaviour of common vehicle consumers, who refuel their cars inside mins rather than recharging it for hours. Moreover, AFCs provide a number above 1,000 Km not like their lithium ion opposite numbers that have a most variety of 250 Km. Our goal is to increase that variety to past 2,000 Km," says Akshay Singhal, the Founder of Log nine Materials, in a communication with The Better India.

"In our aluminium gas cell, we've got aluminium cassette withinside the center and graphene membranes on both side. The graphene membrane maintains the CO<sub>2</sub> out, at the same time as letting oxygen in. When you need to generate energy, water flows in, and it mixes with

oxygen. The next chemical response converts aluminum into aluminium hydroxide, producing energy, that could strength up a car or a home.

Once this cassette reduces in thickness and sooner or later vanishes after strolling over 1,000 KM, It can manually update it with a brand new cassette. It's like sliding a cassette interior a tape recorder. So, the aluminum cassette will slide into the gas cell. The goal is to make sure that those cassettes can be to be had at gas stations. For this to happen, we're operating with current gas vendors as well.

More importantly, that is a very round and recyclable power supply aluminium hydroxide debris which can be created with the aid of using the response may be re-smelted lower back into aluminum the use of easy power. Also, aluminum is absolutely recyclable. generate aluminum the use of renewable power. Aluminum is going into the aluminum gas cell, generates power, and receives transformed into aluminum oxide, and this oxide may be once more transformed lower back into aluminum.

#### **2.4.6 But how did Log 9 Materials arrive at this unique solution?**

They are frequently a graphene production company. Looking at packages of graphene, they explored how it is able to be used to decorate the overall performance of lithium ion and lead acid batteries in electric powered motors with the aid of using the give up of 2017. Although they noticed a marginal development in battery overall performance, it didn't cope with positive key technological demanding situations like charging time and a loss of widespread charging infrastructure.

Moreover, in addition they realised that India is closely depending on Chinese imports in terms of obtaining lithium ion or lead acid batteries. If we're searching at mass EV adoption in India with the aid of using 2030, it's going to burn a hollow in our already developing alternate deficit with China. Today we import sizeable quantities of oil, however day after today we can do the identical with lithium ion batteries.

Instead, the ones at Log nine concept why now no longer utilise what's to be had returned home, which gives greater person pleasant capabilities like refueling, brief refueling time and longer variety and that's once they stumble on AFCs, which had its very own proportion of demanding situations.

“Using our graphene expertise, we solved those demanding situations. We advanced a totally useful prototype in only 18 months, which our international competition like Phinergy from Israel took eight years to build. Also, with AFCs we don't want to broaden an intensive charging infrastructure community that regularly involves a giant capital cost



Moreover, Log nine gas cells are predicted to value 30-forty consistent with cent decrease than their lithium ion counterparts. Aside from providing 5 instances the range, minimum energy consumption, the substances they use on this battery are very simple—aluminum, water (electrolyte), graphene (which comes from graphite). These substances are simply to be had everywhere. Thus, the uncooked substances required to make one are cheaper, and the gadget layout is lots easier than your lithium ion batteries requiring little engineering and commercial strategies for production.

To make certain more adoption, however, we want to take a holistic approach. We want to paintings with OEMs, aluminium manufacturers, and gas vendors in order that we are able to distribute AFCs via the present community of gas vendors. This will permit clients to get right of entry to their aluminum cassettes at everyday gas stations. However, our first business utility of AFCs may be in desk bound strength mills as a right away opportunity for diesel mills, specially for telecom towers.

## **2.5 Industrial Cases**

### **2.5.1 Fame Scheme**

The authorities of India currently sanctioned 670 Electric buses and 241 charging stations below section 2 of Faster Adoption and Manufacturing of Electric Vehicles (FAME) Scheme. The scheme changed into released to beautify the electrical mobility withinside the country.



## **Faster Adoption and Manufacturing of Electric vehicles (FAME) Scheme:**

The Scheme aims for electrification of public transportation.

It provides incentives for three wheelers and four wheelers, especially those used for public transport.

The Scheme was launched to achieve the goals of National Electric Mobility Mission Plan, 2020.

Benefits of the scheme are extended to those vehicles that are fitted with advanced batteries such as Lithium ion batteries.

The scheme seeks to establish 2700 charging stations in metro cities, smart cities and in cities having population more than 1 million.

## **FAME 2**

The second phase of the scheme was launched in 2019. The scheme has to be implemented between 2019. The scheme has to be implemented between 2019 to 2022. A total of 10,000 crores have been allocated for setting up the charging stations. Charging stations will be set up on major highways connecting the city clusters under the scheme. Under the second phase, the Government of India (GOI) has planned to incentivize 5 lakh three wheelers, 35,000 four wheelers and 7000 electric buses,

## **OBJECTIVE:**

The scheme has been launched to counter the environmental pollution and for a better fuel security. It also seeks to increase the demand of electric vehicles, enhancing the vehicle charging station infrastructure and provide a platform for technological innovations.

## **CONCERNS:**

There is a problem concerning the subsidies beneathneath the Electric Vehicle (EV) Adoption Policy. The GOI has currently allowed the sale of electrical automobiles with out batteries to make the electrical automobile extra affordable. Batteries account for 1/2 of the value. If the value of batteries is delinked electric powered and 3 wheelers may want to value much less than fossil-fuel-powered automobiles. But, Manufactures wondered that if automobiles could be offered with out batteries how authorities could supply subsidies for the reason that authorities incentivizes the acquisition of EVs with the aid of using supplying direct buy subsidies that is related to the capability of the battery of the automobile.

### **2.5.2 Tata Nexon EV range controversy**

The Delhi authorities had delisted the Tata Nexon EV from its listing of vehicles which are eligible for its subsidy on electric powered cars after a complainant claimed that his Nexon EV has by no means back a variety of over two hundred km regardless of following dealer-

intimated recommendation and the ARAI-licensed variety being 312 km. Tata Motors replied with the aid of using announcing that the ARAI discern is a validated discern accomplished beneathneath requirements set with the aid of using regulation and that the Nexon EV additionally meets the minimal one hundred forty km variety wished for four-wheelers to satisfy FAME-II subsidy guidelines. The corporation went on to mention that the variety is laid low with different factors and cited that proprietors who've end up acquainted with riding the Nexon EV have visible variety develop with the aid of using up to ten consistent with cent. Read extra at the Delhi authorities's EV coverage here.

The authorities had disregarded Tata Motors' argument, with the reasoning that the only ARAI check end result can't displace the declare from the proprietor who has constantly visible a two hundred km variety in real-international conditions. The authorities similarly cited that Tata Motors has made no attempt to independently affirm the criticism that this declare changed into now no longer an remoted incident.

The Delhi authorities had constituted a panel to attain a very last selection on the problem however suspended the advantages at the Nexon EV with on the spot effect.



### **Finding of the TATA EV case**

As with standard vehicle (with IC engines), the articular vary achieved in EVs relies on AC usage, individual driving vogue and also the actual conditions with which the vehicle is driven. The vary accomplishment is additionally a perform of familiarity with the new technology and customers report enhancements upwards of ten pieces at intervals 4-6 weeks of familiarity.

Also the EV technology is new so there is chances that Consumer face technical glitches.

### 3. Methodology

#### 3.1 Sample and Procedure

Sampling design refers to a framework that describes the procedure through which the sample for the survey will be selected. It is the basic plan for selecting a sample. The sampling design used in this study is Non-probability sampling. The sample size taken for the study is 80. Questionnaire is shared across different age group. In this research study, the sampling method used is convenience sampling method. The sample size of 80 (students and neighbours) is considered to be sufficient for the study. The convenience sampling method under the non-probability sampling design is chosen for the study.

#### 3.2 Data Collection

The method of data collection used in this research study is primary data, and is collected using questionnaire method. The questionnaires was made on Google form and shared through mail and were received within two week. All efforts are made so that the data received is accurate, reliable and relevant to the study. Secondary data were also analysed to get more realistic information. The sources of secondary data include newspapers, Internet, journal and magazines, research papers etc. Data collection procedure includes both primary and secondary data for this study. Questionnaires were sent through mails and other social networking sites.

#### 3.3 Analysis of Data

##### 3.3.1 GENERAL INFORMATION ABOUT THE RESPONDENTS

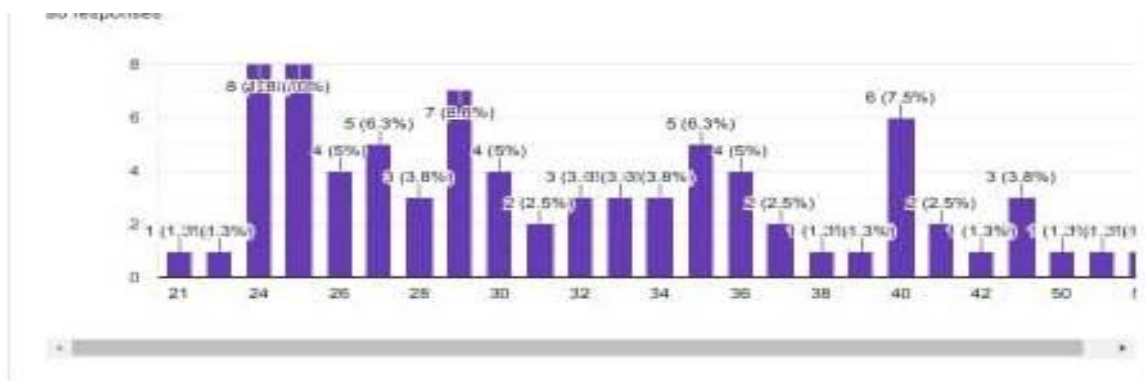


Figure 1

Maximum responses were collected from the age group of 24-40. This depicts that the responses collected belonged majorly to the youths. The maximum number of responses from youth denotes that the majority of respondents were working professional and they use personal vehicle more.

### 3.3.1 EMOTIONAL CONSIDERATIONS

This section of the questionnaire focused on the perception of respondent towards his personal vehicle and includes factors like his satisfaction level; cost of the vehicle he is using, reason for using this vehicle, which brand phone he is using, etc.

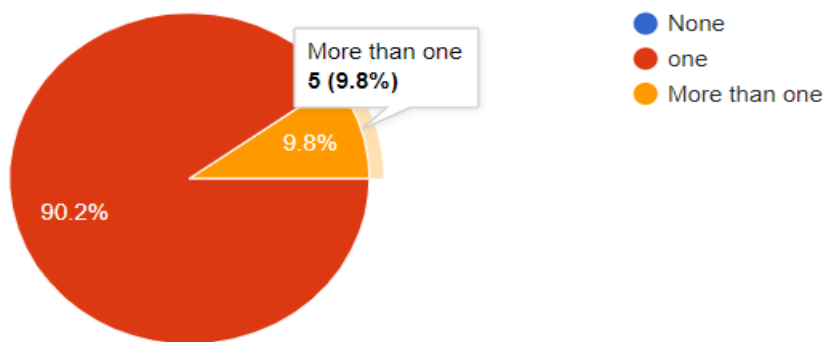


Figure 2

Number of respondent Used electric vehicle

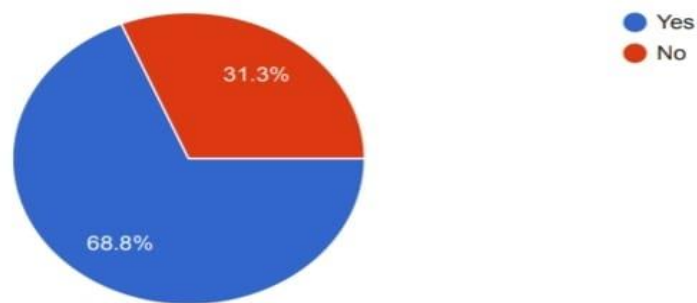
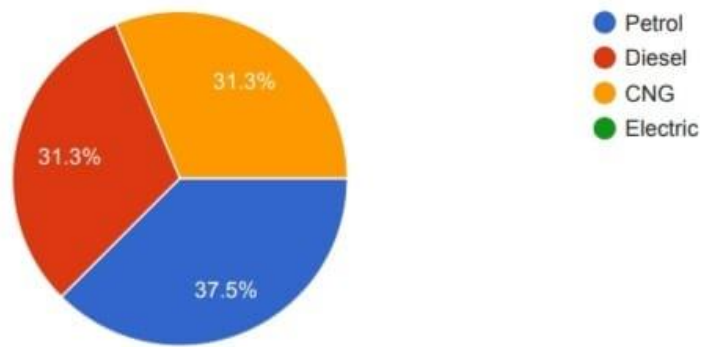


Figure 3

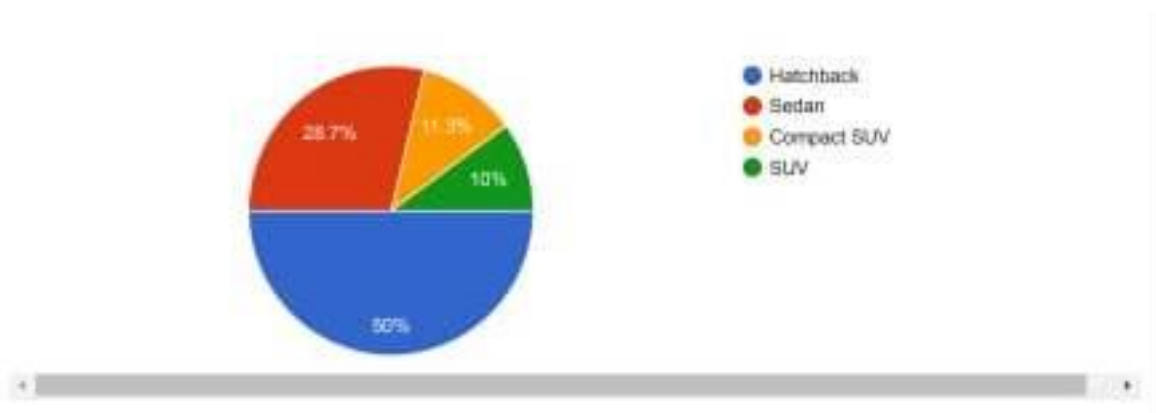
Fuel used by the respondent by for their present vehicle



**Figure 4**

Here 68.8% people used electric vehicle but in terms of but there is none of the respondent buy electric vehicle

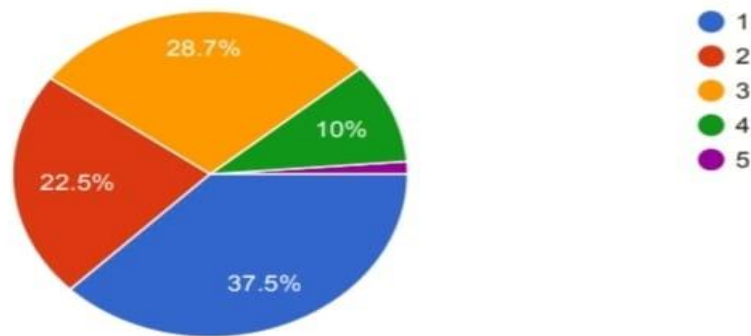
**Reason for purchasing the present vehicle**



**Figure 5**

According to figure 4 & 5 , Majority of respondents have purchased their car because of low cost which are Hatchback . 37.5% respondents purchased their car because of its Petrol car, (from figure 4)

## Infrastructure for electric vehicle



**Figure 6**

37.5 respondent said there is not proper Infrastructure developed for electric vehicles

In order to find out whether there exists any relationship between the price of Electric Vehicle to his/her satisfaction level, a linear regression analysis was done, using Excel sheet of the responses of the questionnaire. Price of Electric vehicle was considered as an independent variable (X variable) and the level of satisfaction was dependent variable (Y variable). This was done to identify whether the price of Electric vehicle has an influence on level of satisfaction derived by them. The finding of this analysis is given below:

### SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.076471911
R Square	0.005847953
Adjusted R Square	-0.014863548
Standard Error	0.709720863
Observations	50

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	0.142222	0.1422	0.282353	0.597613698
Residual	48	24.17778	0.5037		
Total	49	24.32			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>
Intercept	4.244444444	0.381464	11.127	6.85E-15	3.477460669	5.011428	3.477460669
How many cellphones	0.177777778	0.334566	0.5314	0.597614	-0.49491149	0.850467	-0.49491149

do you  
have?

---

R square is equal to 0.005847953, which is far away from the ideal fit 1. This suggests that variation in level of satisfaction is not much related to price of Electric vehicle

To look for the reliability of results, significance F should be less than 0.05. Here, the significance F is 0.597613698, which is greater than 0.05. This clearly indicates that the set of independent variable. Thus, we can say that there is no relationship between price of Electric Vehicle with the level of satisfaction.

## **4. Conclusion and Suggestions**

### **4.1 Suggestion**

1. The study has identified various suggestions towards both Electric Vehicle manufacturing companies and consumers of Electric Vehicle. It is recommended to the manufacturers of Electric Vehicle to consider the uses and various factors that affect the purchasing decision of Electric Vehicle.
2. The price of Electric Vehicle was less than 1million. The criteria for selection of Electric Vehicle were the affordability as well as reviews about the Electric Vehicle. Thus, manufacturer should keep all these factors in mind and can attract new customers and retain old ones by providing the expected features in the budget friendly package.
3. For the users of the Electric Vehicle, the study suggests them to remain updated about the technology but should also be aware about the harmful impacts of the other than Electric Vehicle on environment and should try not to develop better infrastructure to attract maximum customers.

### **4.2 Conclusion**

Based on the analysis, electric powered automobile manufacturers and Government of India have to invest more on social recognition of the automobile via growing more infrastructural facilities, placing more thrust on technology, which can create keep in mind in vehicles. The give up end result truly depicts that the population is well aware of the environmental benefits. Now obligation lies on shoulders of Government and manufacturers that parallel to creating an funding in manufacturing of vehicles, Consumer notion has to created via imparting the above said facilities simply so dream can be converted to reality, humans start adopting electric powered automobile and defend the future of India.

This have a look at targets to discover the elements which have an effect on the adoption of EVs in India. It appears extraordinarily essential to be lessen the dangerous emissions, intake of electricity and additionally enhance the air quality. It may be very a whole lot essential to extend the transportation region right into a inexperienced car region. As a primary step a studies version has been proposed with the to be had literature on adoption of EVs and the adoption of recent technology. From the literature assessment it's far clean that, there are numerous customer associated elements which can be having an effect on withinside the adoption of electrical vehicles. Many of those elements play a massive function because of which the state remains lagging from the adoption of recent technology like EVs. A targeted have a look at can assist to locate the impact and contribution of every variable which may be subjected for the have a look at. Different statistical gear are to be had for the targeted have a look at. The research can locate the obstacles for adoption of EVs and additionally the elements to pay attention for quicker adoption.



## **5. References**

- Neumann, I., Cocron, P., Franke, T., Krems, J.F.: Electric Vehicles as a Solution for GreenDriving in the Future? A Field Study Examining the User Acceptance of Electric Vehicles. In: Proceedings of European Conference on Human Centred Design for IntelligentTransport Systems
- Claas, B., Marker, S., Bickert, S., Linssen, J., Strunz, K.: Integration of Plug-In Hybrid andElectric Vehicles: Experience from Germany. In: 2010 IEEE Power and Energy SocietyGeneral Meeting
- AbuKhalifeh, A.N., and Som, A.P. (2012), “Service quality management in hotel industry: A conceptual framework for food and beverage departments”, *International Journal of Business and Management*
- Alireza, R. (2012), “Measuring service quality using SERVQUAL model: A case study of brokerage offices in Iran”, *International Journal for Quality Research*
- Arash, S. and Reza, D. (2010), “Correlation analysis of service quality gaps in a fourstar hotel in Iran”, *International Business Research*
- Agarwal, O. (2019), “Compulsion to choice: how can public transport in India Be transformed?”, *Economic and Political Weekly*
- Ajzen, I. and Fishbein, M. (1972), “Attitudes and normative beliefs as factors influencing behavioural intentions”, *Journal of Personality and Social Psychology*
- Akehurst, G., Afonso, C. and Martins Gonçalves, H. (2012), “Re-examining green purchase behavior and the green consumer profile: new evidences”, *Management Decision*
- Alba, J.W. (1983), “The effects of product knowledge on the comprehension, retention, and evaluation of product information”, *ACR North American Advances*
- Balakrishnan, K.D. (2019), “The impact of air pollution on deaths, disease burden, and life expectancy across the states of India: the global burden of disease study 2017”, *The Lancet Planetary Health*
- Bang, H.K., Ellinger, A.E., Hadjimarcou, J. and Traichal, P.A. (2000), “Consumer concern, knowledge, belief, and attitude toward renewable energy: an application of the reasoned action theory”, *Psychology and Marketing*
- Aasness, M. A., & Odeck, J. (2015). The increase of electric vehicle usage in Norway—Incentives and adverse effects. *European Transport Research Review*
- Adepetu, A., & Keshav, S. (2015). The relative importance of price and driving range on electric vehicle adoption: Los Angeles case study. *Transportation*
- Ajzen, I., & Fishbein, M. (1977). Attitude- behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*

## **APPENDIX :**

### **A COPY OF QUESTIONNAIRE**

#### **Section 1:**

1. Name:
  
2. Your Age:
  - 17- 20
  - 21- 24
  - 25- 28
  - 28 and above
  
3. Which type of car you have?
  - Hatchback
  - Sedan
  - Compact SUV
  - SUV
  
4. How many years you have been used this car
  - 1-11 months
  - 1 year
  - 2 years
  - 3 years
  - 4 years
  - 5 years
  - 6 years
  - 7 years
  - 8 years
  - 9 years
  - 10 years
  - More than 10 years
  
5. Have you ever been used electric cars?
  
6. What is effect on the environment by using electric vehicle?  
(Here 1 means lower level of satisfaction and 5 means higher level of satisfaction)
  - 1
  - 2
  - 3

4

5

7. Is electric vehicle value for money?

1

2

3

4

5

8. Is there proper availability of Infrastructure developed to fulfil the basic requirement of electric vehicle?

1

2

3

4

5

9. Are you satisfied with your existing car?

Yes

No

10. How much are you satisfied with the functionalities of your phone?

0      1      2      3      4      5

11. What are the main reasons of your dissatisfaction of electric vehicle?

Price of the EVs

Low battery backup

Unavailability of charging stations

Other reasons

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## Sources Overview

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OVERALL SIMILARITY

1	www.europeanjournalofscientificresearch.com	INTERNET	3%
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**Project Dissertation Report on**

**PERCEPTION OF E-VEHICLES AMONG  
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