



# An Empirical Study on Transaction from ICE [Internal Combustion Engine- Petrol, Diesel] to EV [Electrical Vehicle]: 2019 Indian Era of Green Mobility with Special reference to the Customer Buying Pattern in Indian Car Segment

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**Abstract:** 2019, the beginning of Green Mobility era in Indian vehicle segment especially with reference to the car segment. Many countries of the world are thinking seriously about the emission from passenger and public transport system. There was the era of ICE [Internal combustion Engines] that leads us to the growth and development pathway in terms of industrial and economic development.

Indian market is price sensitive and buyers' market, where the decision of purchasing depends on many factors. Apart from consumer goods the focus of the research paper is on the Indian car segment, car is moved from the luxury to necessity of the public as the population and variety of car models are available in the market. People shift the decision of purchasing the car from any major or minor reason it is more complex decision as it involves all the family members. In 2019 budget, Government of India has taken major steps to push electrical vehicle into market by giving many incentives to car manufacturers and common people.

The area of research paper is focusing on the Indian car segment to understand the new upcoming segment in the car that is Electrical power driven cars, to understand more in depth this paper is supported by the views of the customers through an empirical study.

**Keywords:** ICE [Internal Combustion Engine – Petrol, Diesel], EV [Electrical Vehicle], Indian Car Segment, Buying behavior, Indian Government Budget-2019, Government Incentives, Green Future, Pollution.

## I. INTRODUCTION

This paper is focusing and analyzing the future need of the Indian car segment. In India the decision of buying a car specially is a combine decision of all the family members each and every one is contributing their own views based on the shape, size, color and performance of the model. There are many other factors involves than these like car loan rate, discount, insurance, registration, tax, service and sales network etc.

There has been increase in the car segment both the buyers and the manufacturers in recent years earlier Hindustan Motors, Fiat and Maruti were there to compete. Nowadays, there are more competitors and more models to choose among the diesel and petrol variants of cars, there is competition among the banks to provide car loans for buyers at competitive rates. Time to time government decisions also influence the decision making of car buyers.

“India’s largest carmaker will have sold its last diesel car by the end of this financial year.

“From April 1, 2020, we will have no diesel car on sale,” Maruti Suzuki chairman R C Bhargava said yesterday (April 25). “Depending on how customers react... if we find there is a market for diesel cars (after the new emission norms kick in) we will develop it in a reasonable amount of time.”

Maruti Suzuki has diesel versions for seven of its models: Swift, Dzire, Vitara Brezza, Baleno, Ertiga, Ciaz, and S-cross.” [1]

Sometimes, the external factors like mentioned above act as the deciding factors more prominent rather than the choice of the buyer. Another external influence from government of India on the Indian car segment comes into the picture from union budget 2019, the government is seriously thinking about the Green future and promoting EV [Electrical Vehicle] instead of ICE [Internal Combustion Engine].

Indian economy’s major part is driven by the transportation by road and many other small sectors are linked to it like service, hotel, tourism etc. to consider the green future of India major metro cities of the India are going to get some incentives to promote the electrical vehicles.

In 2019, Indian government has declared some incentives to promote the purchase of Electrical vehicle such as Income Tax benefits and other which will be discussed later. Car manufacturers are happy from these decisions they are hoping a better future for car in electrical segment. There are many hurdles in the pathway as EV are new to the market it will take some time to be accepted in the market as people



are having many different views and misconceptions. Another point to ponder here is that the lack of infrastructure for EV like trained staff, charging stations, battery etc.

## II. EV [ELECTRICAL VEHICLE] USED IN THE WORLD

EV [Electrical Vehicle] are new to the Indian market but they are being widely used in many country of the world. There are many countries like Norway who are providing many incentives to the electrical car users. Using of electrical vehicle is in support of green environment as they do not emit any pollutant while driving.

The Norwegian success story is first and foremost due to a substantial package of incentives developed to promote zero-emission vehicles into the market. The incentives have been gradually introduced by different governments and broad coalitions of parties since the early 1990s to speed up the transition. The Norwegian Parliament has decided on a national goal that all sold by 2025 should be zero-emission (electric or hydrogen). As of May 2018, there are 230,000 registered battery electric cars (BEVs) in Norway. Battery electric and plug-in hybrid vehicles together hold a 50 % market share. The speed of the transition is closely related to policy instruments and a wide range of incentives.

The current Government has decided to keep the incentives for zero-emission cars until the end of 2021. The VAT exemption for zero-emission vehicles in Norway has been approved by the EFTA Surveillance Authority (ESA) until the end of 2020. After 2021 the incentives will be revised and adjusted parallel with the market development.

### The Norwegian EV incentives:

• No purchase/import taxes (199€-)
• Exemption from 25% VAT on purchase (200€-)
• No annual road tax (199€)
• No charges on toll roads or ferries (199€- 2017).
• Maximum 50% of the total amount on ferry fares for electric vehicles (2018-)
• Maximum 50% of the total amount on toll roads (2019)
• Free municipal parking (199€- 2017)
• Parking fee for EVs was introduced locally with an upper limit of a maximum 50% of the full price (2018-)
• Access to bus lanes (200€-).
• New rules allow local authorities to limit the access to only include EVs that carry one or more passengers (2016)
• 50 % reduced company car tax (200€-2018).
• Company car tax reduction reduced to 40% (201€)
• Exemption from 25% VAT on leasing (2015)
• Fiscal compensation for the scrapping of fossil vans when converting to a zero-emission van (2018)
• Allowing holders of driver license class B to drive electric vans class C1 (light lorries) up to 2450 kg (2019)

The number of electric car sales worldwide reached a record high in 2018, with more than 2 million battery electric cars (BEVs) and plug-in hybrids (PHEVs) sold. In the UK alone, data from the Society of Motor Manufacturers and Traders showed a 22% increase in sales compared with 2017.

Table 1: Showing Top 10 countries for electric car sales worldwide (2017)

Country	New electric car sales*	Market share of electric cars
China	579,000	2.2%
USA	198,350	1.2%
Norway	62,260	39.2%
Germany	54,560	1.6%
Japan	54,100	1.0%
UK	47,250	1.7%
France	34,780	1.7%
Sweden	20,350	6.3%
Canada	16,680	1.1%
Netherlands	11,070	2.7%

Data from the IEA's Global EV Outlook 2018 – \*includes BEVs and PHEVs.

Source: <https://webstore.iea.org/global-ev-outlook-2018> [3]

### Norway

In terms of overall brand-new electric car sales by country, Norway comes in third behind China and the USA. But its comparatively small population means the Scandinavian nation leads the way when it comes to market share.

### China

If 2017 was the breakthrough year for electric car sales worldwide, China had a significant hand in it. More than 700,000 BEVs and PHEVs were sold in China during 2017 – 579,000 of which were private passenger vehicles.

### USA

With almost 200,000 units sold in 2017, the USA ranked second for sales of electric cars per country. Even though it lagged some way behind China, sales in the USA were still up by roughly a quarter on 2016, which seems more impressive when you consider total car sales dropped for the first time since 2009.

### UK

By 2040, the UK government is expecting most and vans sold to be 100% zero-emission and all and vans to have significant zero-emission capability. By 2050, the expectation is for almost every car and van on the road to be zero-emission.

### Fast-growing countries

The USA, China and Europe are responsible for around 9 in 10 sales of electric cars, but Japan and South Korea are also major players. Meanwhile, Iceland is the only other country apart from Norway where electric cars recorded double-digit market share in 2017 (13%).

Much like Norway, the issue with Iceland is its small population. While the market share of BEVs and PHEVs looks impressive on paper, it still only equates to around 3,000 vehicles. [4]

In the list of worldwide countries where there is a sale and usage of electrical cars India is even not in the list till 2018 data. Small population countries in comparison to India like Norway and Iceland even they have Electrical vehicle in double figure. Many parts of the world has already



understand the need of green environment and they are already started working on it, china, UK, USA are the examples.

Looking at the incentive provided to the customer for purchasing and using the electrical vehicle by Norway government it is an appreciable step towards the green future. Indian government in the 2019 budget has taken few steps forward towards “the Green Future” by allowing few rebates and tax benefits, to promote the sale and usage of Electrical vehicles in India.

### III. INDIAN AUTOMOBILE MARKET: AN OVERVIEW

Indian automotive industry is one of the largest auto markets in the world. It has grown up very fast in last one decade. India’s passenger car and commercial vehicle manufacturing industry is 6th largest in the world after China, US, Japan, Brazil and Germany.

Automobile market is majorly dominated by two wheelers and car market is a bit lower in comparison to the same. The fact is the price of two wheelers and four wheelers [cars] cannot be compared in terms of market share these are two different market segments but they come altogether in automotive industry. In this research paper the area of concern is to study the car market, as the author is going to focus on the electrical cars in the car segment to narrow down the research funnel.

Top 4 carmakers Maruti, Hyundai, M&M, and Tata accounted for over 82 percent of the Indian Passenger Vehicle market. There are other participants who are marking their presence in the market but they are having low impact in comparison to these four top leaders. The following two graphics indicates the market share of different car companies and their market share in the year 2017 and 2018. Maruti Suzuki has shown the small increment in the market share and still the leader of the market. [5]

Overall there is not much change in the market position in terms of market percentage, although there is an incremental effect in the market but it is stable. In the year 2019, Indian government in the budget has declared some incentives to the car manufacturers and the customer to motivate towards electrical vehicle manufacturing and purchasing and moving towards Green India.

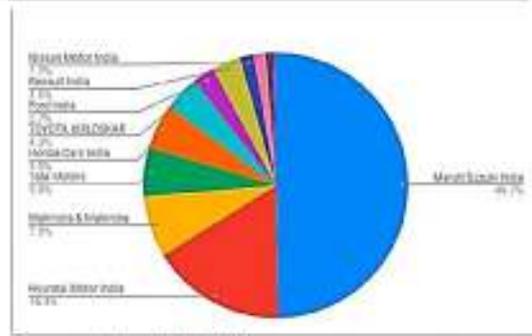
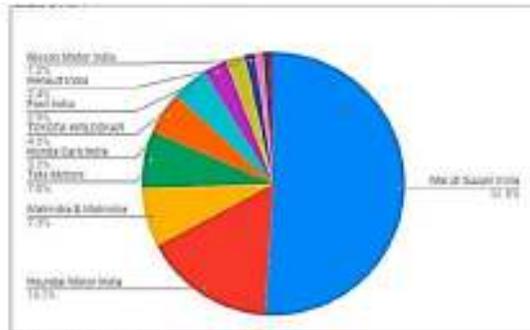


Fig. 1 Showing Passenger Vehicle market share in the year 2017 and 2018.

Source: <https://auto.economicstimes.indiatimes.com/news/industry/complete-india-auto-sales-analysis-2018-cv-sales-crosses-a-million-mark/67549073>

Table 2: Showing Top Car Manufacturer in calendar year 2017 – 2018 and % growth.

RANK	OEM	CY2018	CY2017	% Growth
1	Maruti Suzuki India	1731450	16,02,522	8.05
2	Hyundai Motor India	550002	5,27,319	4.30
3	Mahindra & Mahindra	249301	2,42,386	2.85
4	Tata Motors	237217	1,91,107	24.13
5	Honda Cars India	174859	1,78,755	-2.18
6	TOYOTA KIRLOSKAR	151480	1,39,566	8.54
7	Ford India	97804	88,184	10.91
8	Renault India	82368	1,12,489	-26.78
9	Nissan Motor India	41586	53,390	-22.11
10	Volkswagen India	37018	47,749	-22.47
11	FCA India	18408	15,837	16.23
12	Skoda Auto India	16692	17,438	-4.28
13	*Others	5520	5,478	0.77
	<b>Total</b>	<b>3393705</b>	<b>32,22,220</b>	<b>5.32</b>
	*Others = Isuzu, Force and Hindustan Motors	CY = Calendar Year		

Among all the largest gainer was Tata Motor which posted 24.13 percent growth at 2,37,217 units in the calendar year 2018 recording a market share of 7 per cent from earlier 5.9 percent in 2017. Riding on the success of Nexon and Tiago.

While the largest passenger vehicle manufacturer Maruti Suzuki recorded 8.05 percent at 17, 31,450 units recording 51 percent market share in the calendar year 2018. Similarly, Ford and Toyota witnessed growths of 10.91% and 8.54%, respectively.



Table 3: Showing the Automobile Domestic Sales Trends [6]

Category	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Passenger Vehicles	24,04,508	26,01,334	27,00,288	28,45,501	32,88,583	31,77,214
Commercial Vehicles	6,12,851	6,05,948	6,05,504	7,14,682	8,58,810	10,07,318
Three Wheelers	4,36,085	5,32,628	5,34,208	5,11,879	6,35,690	7,60,811
Two Wheelers	1,41,06,778	1,59,72,581	1,64,35,851	1,75,39,759	2,02,08,117	2,13,81,566
Quadracycles			0	0	0	627
<b>Grand Total</b>	<b>1,74,23,223</b>	<b>1,97,24,371</b>	<b>2,04,69,771</b>	<b>2,13,65,289</b>	<b>2,48,81,312</b>	<b>2,62,67,733</b>

# Only Aug 18 -March 2019 data is available for 2018-19

Source: <http://www.siamindia.com/statistics.aspx?mpgid=8&pgidtrail=14>

All the ups and downs in the automobile sector are due to customer demand and some external factors such as government policies, as in introduction the author quoted statement about the closing of the production of the Diesel cars from next financial year due to strict emission norms, the car manufacturers are not ready to increase price of the vehicle as it cost more to maintain the proposed emission norms.

Looking to that in the year 2019, the government of India in the current budget give some relief to the car manufacturers by giving some incentives to promote Electrical Vehicle in India. This will certainly create a different segment in the car market and people and car manufactures will try to explore this new segment in the Indian market, as Diesel segment in car will not have new cars people will think to shift to the new car segment of electric cars, few of the electric car models are in the market although they have some initial issues in acceptance but they have the scope in the market a many countries are already promoting electrical vehicle and moving towards zero – emission and green future.

#### IV. EV [ELECTRICAL VEHICLE] IN INDIA

In above sections of the research paper from the data available it is implied that market is opening up for the Electric Vehicle The electric vehicles segment has seen a great surge in many parts of the world. To tap this industry, car manufacturers in India have started to develop and launch electric vehicles that offer great performance.

Currently, only a handful of electric four-wheelers are available in India. The choices are limited to only Tata Tigor EV, Mahindra eVerito and Mahindra e20 Plus. However, the scenario is going to completely change in the coming few months as several major carmakers are expected to launch their EVs in the country. The major hope is due to the 2019 budget encouragements announcement for the electric vehicle segment people can find more variants and pocket friendly price in near future.

Table 4: Showing the Electric Automobile available and coming in near future.

Source: <https://auto.ndtv.com/new-cars/quadracycle-cars?filter=convertible-coupe-crossover-electric-hatchback-muv-suv-sedan>, <https://www.bankbazaar.com/car-loan/upcoming-electric-cars-in-india.html> [7] [8]

Model/Name	Type	Transmission	Powered By	MPGage	Price
Hyundai Kona Electric	SUV	Automatic	Electric	152,000km/Full Charge	₹ 28.81 Lakh
Hyundai Kona Electric Premium	SUV	Automatic	Electric	152,000km/Full Charge	₹ 30.24 Lakh
Mahindra eVerito EV	MPV	Automatic	Electric	175,000km/Full Charge	₹ 15.95 Lakh
Mahindra eVerito EV	Sedan	Automatic	Electric	175,000km/Full Charge	₹ 20.80 Lakh
Mahindra eVerito EV	Sedan	Automatic	Electric	175,000km/Full Charge	₹ 22.91 Lakh
Mahindra eVerito EV	SUV	Automatic	Electric	175,000km/Full Charge	₹ 24.88 Lakh
Mahindra eVerito EV	MPV	Automatic	Electric	175,000km/Full Charge	₹ 25.10 Lakh
Mahindra eVerito EV	SUV	Automatic	Electric	175,000km/Full Charge	₹ 26.10 Lakh
Tata Tigor EV	Sedan	Automatic	Electric	150 km/Full Charge	₹ 1,20,000 - 1,10,000 INR
Renault ZOE	SUV	Automatic	Electric	300 km/Full Charge	₹ 1.50 Lakh
Renault ZOE	MPV	Automatic	Electric	300 km/Full Charge	₹ 1.80 Lakh

The electrical vehicle in the market are no different in looking and performance, but the difference lies in the technology and price. Looking at the above table [table 4] the different electrical cars are having different price labels and different millage when it is fully charged ranging from 80 km to 450 km. electrical cars are almost silent and no emission of any kind on running.

#### V. EV [ELECTRICAL VEHICLE] HITTING THE ROAD IN NEAR FUTURE

There are few more electrical cars coming into the market in near future. Car manufacturer around the world are working on the electrical vehicle many countries are already using these cars and they are the part of the transportation system. Following images are of the electrical cars available in the world market many of them could be a part of Indian transport system in near future, as electric segment is a new segment to explore in the Indian market. Many of the car manufacturer are already doing business in India in automobile segment and few new entrant may come looking at the promising market and demanding market of India.



Porsche Taycan



Interior of Porsche Taycan



Jaguar I - Pace



Volkswagen ID Buzz



2019 Nissan Leaf Plus



Volkswagen ID Cross



Aston Martin Rapide E



Volkswagen ID.3



Tesla Model Y



Audi e-Tron



Tesla Roadster



Interior of Audi e-Tron



2019 Chevy Bolt EV



Mercedes - Benz EQC



Mini Cooper SE



Mercedes - Benz EQA



Folestar 2

Volvo XC40 EV



BMW iX3



Cadillac Electric Crossover

Fig. 2 showing various upcoming Electric Vehicles in Near Future  
source: Internet.

Looking at the amazing eye catching design of electrical cars the future of the Indian car market is electrifying. Indian market is very typical choosy market they having different deciding patterns while purchasing, the consumer behavior pattern is typical in terms of car buying the looks and color are few important point to decide while purchasing.

#### VI. CHALLENGES AND INFRASTRUCTURE FOR EV [ELECTRICAL VEHICLE] IN INDIA

Electrical vehicles in Indian market can have initial hesitation due to unavailability of infrastructure and mindset challenges. The rapid growth in India's urbanization, population and wealth over the last few decades has had changed the mobility of its citizens. India's transport demand has grown by almost 8 times since 1980 – more than any other Asian economy (World Bank data, cited by NITI Aayog). While on the one hand, this has led to widespread development of the auto industry in the country, on the other hand, it has revealed the potential for irreversible damage on the environment.

The main question is why we need electrical vehicle, the answer to the question could be urbanization and increase in population. As these two factors in the picture there is an increase in demand of better transportation options for people and to fulfill it there are automobile manufacturers who are fulfilling the demand from last many decades. Every coin has two sides likewise transportation fulfillment need also has one side is convenience, speed and time saving another side is end result of moving vehicle – air pollution. Many metro cities are having polluted air due to heavy traffic. Electrical vehicle are the alternate solution to the transport need and pollution free environment.

There are some challenges associated to the electrical vehicle such as –

- **Cost of EVs** – the electrical vehicle are a bit costly in comparison to its ICE variant. Many of its parts like battery are imported from outside country that make it costly than its ICE variants. There are other factors like Tax on imports and other taxes which ultimate raise the cost.

- **Unsuitable for long drives**- this is one of the major hindrance in buying electrical vehicle, people used to travel at long distance across the city taking the electrical vehicle for long drive creates the sense of uncertainty especially when you are driving with family.
- **Electrical Vehicles in India lack speed/ mileage**- this is another point “the speed” its limitation is due to the battery operation, the electrical vehicles available in India right now at initial stage are lacking the speed thing few are giving speed and mileage they are very costly.
- **Battery** - the main component in any electrical vehicle driven car. The cost of battery as it is imported it is high, although it came down to somehow acceptable range in recent years but if we see it is still on the higher end. Battery is the main difference maker in the cost of the electrical vehicle. There is decrease in the use of lead used battery and increase in lithium based battery.

#### Price factor

Use of lithium-ion battery is expected to show significant rise in days to come with the projected fall in its price.

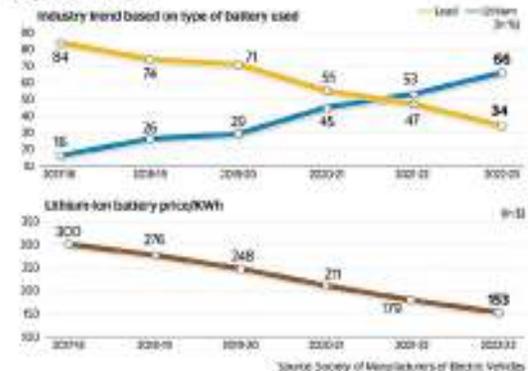


Fig. 3. Showing Industry Trend and price of battery comparison in coming years.

Source: [https://images.livemint.com/r/LiveMint/Period2/2017/11/16/Photos/Processed/g\\_electric-vehicle\\_web.jpg](https://images.livemint.com/r/LiveMint/Period2/2017/11/16/Photos/Processed/g_electric-vehicle_web.jpg)

- **Charging stations**- another important factor associated to the electrical vehicle, when electrical vehicle is compare with ICE vehicle, ICE vehicle has advantage of fuel refilling availability at short duration that gives a mental comfort zone in terms of electrical driven vehicles charging infrastructure yet to be develop in metro cities few fuel stations are providing the services but it is not sufficient to fulfill the needs.
- **Time consumption in charging**- this factor is not adjustable by any means, electrical vehicle take the time that it require a normal charging takes 7 – 8 hrs. to charge it completely and fast charger take more than an hour to charge it, when it is compared to refuel to ICE vehicles it takes few minutes and you are ready to go.
- **On road maintenance**: - the scenario is same, when the normal ICE vehicles were upgraded with IC chips for better fuel economy, service people with their own garage having difficulty in servicing these upgraded cars this factor also affected the person whose car had been broken down and the service people are unable to



maintain it. The last option is the company service station if it is available at the place of car broken down. The popularity of Maruti in India is due to the same factor availability of service people to maintain the broken vehicle whether from company or private garage.

- **Availability of spare parts-** spare parts another point to ponder in terms of electrical vehicle, as a new entrant to the market the spare part availability is restricted to the company service station and there could be price issues too. As compared to the ICE vehicle market is full of original and alternative spare parts at affordable rate.
- **Lack of skilled workers:** EVs have higher servicing costs and higher levels of skills is needed for servicing. India lacks the dedicated training courses for such skill development.
- **Availability of Raw Material for battery** - India does not have any known reserve of lithium and cobalt, it is dependent on countries like Japan and China for the import of lithium-ion batteries. Rupee depreciation has also negatively affected such imports.
- **Lack of awareness:** The people need to be made aware about the benefits of the EVs and the dangers of pollution caused by ICE.

## VII. BUDGET 2019 AND EV [ELECTRICAL VEHICLE]

Government Initiatives to promote electrical vehicle in India. Indian Government is moving step by step in the direction to achieve the target of green India and lower down the pollution in major state of country. In this process -

- In 2015, the Government introduced a scheme called the Faster Adoption and Manufacturing of hybrid and Electric vehicles (**FAME**) in order to promote electric vehicles.



Fig. 4. Showing FAME India details

Source: <http://pib.nic.in/newsite/PrintRelease.aspx?relid=154119>

- In 2015, the National Electric Mobility Mission Plan was drafted to achieve fuel security by expecting to achieve sales of electric and hybrid cars to reach six to

seven million by 2020.



Fig. 5. Showing details of National Electric Mobility Mission Plan  
Source: <http://pib.nic.in/newsite/PrintRelease.aspx?relid=116719>

- State run firm Energy Efficiency Services Limited (EESL) has appointed the nodal agency to procure around 10,000 electric cars to replace existing government vehicles.



Fig. 6. Showing EESL replacing Govt. ICE Vehicle with Electrical Vehicles

Source: <https://energy.economicstimes.indiatimes.com/news/power/eesl-to-procure-10000-electric-vehicles-to-replace-governments-fleet/60076540>

- The Karnataka State Government has approved a policy to promote research and development in electric mobility making it mandatory to have charging points and pods in all major cities of the state.



Fig. 7. Showing news of Karnataka wants to EV capital of India.

Source: [https://www.business-standard.com/article/economy-policy/karnataka-wants-to-become-the-electric-vehicle-capital-of-india-117091301226\\_1.html](https://www.business-standard.com/article/economy-policy/karnataka-wants-to-become-the-electric-vehicle-capital-of-india-117091301226_1.html)

- The Maharashtra State Government waived off some taxes for Electric Vehicles ever since it became India's First State to have an Electric Mass Mobility System.



- The Government plans to setup lithium-ion battery making facility under supervision of Bharat Heavy Electricals Limited (BHEL).
- The Goods and Services Tax (GST) Council has set a tax rate of 12% compared to 28% set for petroleum based vehicles.

The Government has already moved GST council to lower the GST rate on electric vehicles from 12% to 5%, she added.



Fig. 8. Showing Govt. Lowering GST in year 2017, from 28% to 12%.  
Source: <https://www.livemint.com/Industry/OcpXxo4ix2qIQeljYbNGgK/Govt-sets-low-GST-rate-for-electric-vehicles-to-boost-sales.html>



Fig. 10. Showing Govt. exemption on Income Tax in budget 2019.  
Source: <https://www.businesstoday.in/union-budget-2019/news/budget-2019-tax-relief-on-auto-loan-evs-to-fetch-rs-15-lakh-income-tax-exemption/story/361818.html>

The Finance Minister informed that Phase-II of FAME Scheme 2019, following approval of the Cabinet with an outlay of Rs.10, 000 crore for a period of 3 years, has commenced from 1st April, 2019. The main objective of the Scheme is to encourage faster adoption of Electric vehicles by way of offering upfront incentive on purchase of Electric vehicles and also by establishing the necessary charging infrastructure for electric vehicles. [11.]



Fig. 9. Showing Govt. Lowering GST in year 2019, from 12% to 5%.  
Source: <http://pi.bphoto.nic.in/documents/Others/Gbudget2019/eallrel.pdf>

Promoting Electric Vehicles to make Electric Vehicles affordable to consumers, the Minister said that the Government will provide additional income tax deduction of Rs. 1.5 lakh on the interest paid on loans taken to purchase electric vehicles. This amounts to a benefit of around Rs.2.5 lakh over the loan period to the taxpayers who take loans to purchase electric vehicle. Considering India's large consumer base, she stated, "We aim to leapfrog and envision India as a global hub of manufacturing of Electric Vehicles. Inclusion of Solar storage batteries and charging infrastructure in the above scheme will boost our efforts".

Indian government is making the moves towards the achieving the pollution free green India. The GST has come down to 5% from 28% it is a good move to lower down the cost of electric vehicle another benefit in the income tax 1.5 lakh on the loan taken on electrical vehicle.

The government has made its move now the ball is in the court of car manufacturers and consumers who direct the demand and supply scenario. The consumer behavior is different for different items, when it comes to the car purchasing there are many factors involved color, size, price, discount, parents, friends and relatives, brand image, after sales services etc. that makes it more typical to choose. The detailed study of consumer behavior is discussed in the next section.

## VIII. CONSUMER BUYING BEHAVIOR

### 4 types of consumer buying behavior

Wants are unlimited and the resources to satisfy these wants are limited. So the consumers think rationally before buying any product. Buying a toothpaste is totally different from buying a luxury car. The more expensive the good is the more information is required by the consumer. There are four types of consumer buying behavior on the basis of buyer involvement while purchasing any product.



Table 5: Showing consumer buying behavior

	High involvement	Low involvement
Significant differences between brands	Complex buying behavior ( <i>motor cycle, Car</i> )	Variety seeking behavior ( <i>washing detergent</i> )
Few differences between brands	Dissonance buying behavior ( <i>floor tiles</i> )	Habitual buying behavior ( <i>toothpaste</i> )

**High involvement:** - the term means when the consumer is highly involved while buying a product. Generally this situation happens in case of expensive or luxuries goods. Like while buying a diamond necklace a consumer is highly involved.

**Low involvement:** - this term means when the consumer is not highly involved while buying a product. It happens in case of low price goods. Like while buying toothpaste a consumer is not highly involved.

**Significant differences between brands:** - it means when there are significant differences between brands.

**Few differences between brands:** - it means when there are very little differences between brands.

1) **Complex buying behavior:** - when the consumer is highly involved in the buying and there is significant differences between brands then it is called complex buying behavior. So in this case the consumer must collect proper information about the product features and the marketer must provide detailed information regarding the product attributes. For eg. Consumer while buying a *motor cycle* is highly involved in the purchase and has the knowledge about significant differences between brands.

2) **Variety seeking behavior:** - in this case consumer involvement is low while buying the product but there are significant differences between brands. Consumers generally buy different products not due to dissatisfaction from the earlier product but due to seek variety. Like every time they buy different *washing detergent* just for variety. So it is the duty of the marketer to encourage the consumer to buy the product by offering those discounts, free samples and by advertising the product a lot.

3) **Dissonance buying behavior:** - here consumer is highly involved in the purchase but there are few differences between brands. Like consumer while buying a *floor tiles* buy them quickly as there are few differences between brands.

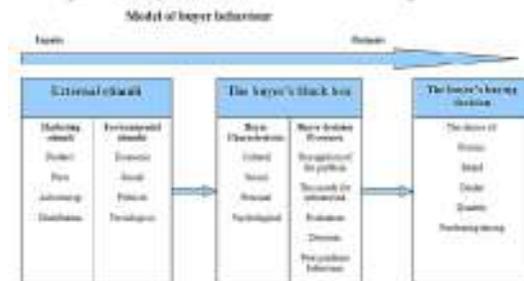
4) **Habitual buying behavior:** - in this case there is low involvement of the consumer and there are few differences between brands. The consumer buys the product quickly. For eg. *Toothpaste*. [12]

Stimulus Response Model  
Buyer Behaviour - Stimulus-Response Model



Fig. 11. Showing Stimulus Response Model

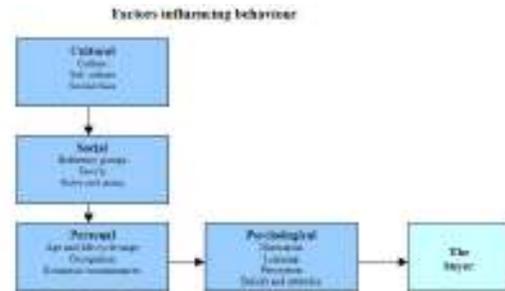
Source: <https://www.comindwork.com/weekly/2019-06-24/productivity/buyer-behaviour-stimulus-response-model>



Source: Philip Kotler (1991), *Marketing Management: Analysis, Planning, Implementation and Control*, Prentice-Hall

Fig. 12. Showing Model of buyer behavior

Source: Kotler



Source: Principles of Marketing P Kotler, G Armstrong, Jacobson and V Wong (2001)

Fig. 13. Showing factors influencing buyer behavior

Source: Kotler

To understand buyer behavior is the stimulus-response model. Marketing and environmental stimuli enter the buyer's consciousness. The buyer's characteristics and decision process lead to certain purchase decisions. The marketer's task is to understand what happens in the buyer's consciousness between the arrival of outside stimuli and the buyer's purchase decision.

A consumer's buying behavior is influenced by cultural, social, and personal factors. Cultural factors exert the broadest and deepest influence. Culture is the fundamental determinant of a person's wants and behaviors. Each culture consists of smaller subcultures that provide more specific identification and socialization for their members. Subcultures include nationality religion, racial groups, and geographic region. [11]



According to the current research paper and topic the behavior of customer is stimulated by the external factors [other stimuli] that includes **Economic, Social, Political and Technological**. As the electrical vehicle are promoted by the government by offering some discounts and incentives to the car manufacturers and customers in the 2019 budget that will certainly influence the decision for buying electric car, another factor technological aspect the electric vehicle are more technical sound with high peak performance and with zero emission of pollutant this will protect the environment other factor economics that is depending upon the law of demand and supply. Initially the few car manufacturers have introduced the electrical version of their selling model like TATA Tigor, there are many international brand yet to come to the Indian market. As the time passes and the demand of the electrical supply will increase and the price will go down due to future anticipated work of making some parts indigenous to lower the cost of the vehicle the interest of the people will increase and market works like this only.

Introduction of electrical vehicle is a must to be taken step of obvious reasons and fuel used in the ICE vehicles is finite and the cost of the oil is increasing day by day as the demand of oil is increase due to the introduction of passenger and commercial vehicle every year by some time it will be next to impossible to full fill the demand of oil for these vehicles, so it is better to start early and switch over to the alternatives. Electrical driven vehicle is a better alternative to switch over. The stimulus-response model of the buyer behavior, it shows stimuli as input and buyer response as output with the process of decision-making in the middle which depends on the buyer's characteristics.

Buyer's Character:

- Social.
- Cultural.
- Personal.
- Psychological.

These are the buyer's characteristics that influences the decision making process for the product [electrical car] as point of interest in this case. A small amount of change or difference in the specification that doesn't implies the positive reference for the product can affect the sales. For e.g. In this case the buyer has all the external influences like policies, government incentives but personally the buyer is not satisfied or having the uncertainty of using the electrical vehicle in long drives along with family most probably he will drop the decision of buying electrical vehicle.

Similarly, the decision process has many factors included as state below:

Buyer's Decision Process:

- Problem recognition.
- Information search.
- Evaluation.
- Decision.
- Post-Purchase behavior.

Cars had moved from luxury commodity to a necessity one and due to increase in the disposable income and offering from various bank for loan and discounts and incentives from the car dealers the car has come in the reach of common people and the demand and supply law is applicable here as well fitted one. The factors as mentioned

above the buyer's decision making process is depending upon these factors like post purchase behavior of the product here it is directly not applicable but the brand who is selling the electrical vehicle variant has negative image in the mind of buyer that will affect the decision. Let us assume the buyer had purchased the electrical vehicle and had suffered from some problems due to initial infrastructural support issues the buyer will not give positive feedback that will again affect the decision making process of another buyer. To overcome all the decision affecting issue initially and in future the government and car manufacturers had to think critically and try to remove all the issues that can affect the decision making process of buyer.

In this research paper the author has made an effort to understand the buyer's behavior in the light of various factors like government policies etc. what could be the future of the electrical vehicle in India, how will the people react and what could be the hurdles in the mind set of customer/ buyer for new car segment. For better and deep understanding the author has designed questions to get the feedback on the various issues that could lead car manufacturers and could give stimuli to improvise the government policies.

#### XI. EMPIRICAL STUDY OF CONSUMER BUYING BEHAVIOR FOCUSING ON ELECTRICAL VEHICLE

Consumer buying behavior, is a typical behavior that comes into the picture when a person thinks to buy the product for himself/ herself or for others, like the things for personal uses perfume or deo then it is only perfume or deo fragrance it matter then it comes for price and all other things when the product is of the family use like toothpaste or toilet soap hen price, packaging, offers and family choices matters. The behavior of the consumer or customer is different for the different product depending on the degree of involvement of the person for the product. The involvement is also dependent on the information about the product he/ she have, the sources of information is manufacturer/ market driven in terms of advertisements in different media and mouth to mouth publicity. The buying behavior and the decision of purchasing the product is depending on many factors whether it is big or small it immediately changes the buying decision.

Indian market is full of uncertainty in terms of making buying decision of nay product it is not fixed on certain factors but it is a mix of complex decision making based on many different factor. To study the consumer buying behavior according to the paper theme "Electrical vehicle and ICE vehicle" the major motivating factor is external actor that is from government budget in 2019 about the policies for electrical vehicle the tax and GST etc. Indian car market is a big market to understand there are many players of international fame are marking their presence from many years the level of competition in car market has been raised under this condition the new entrant to the market the "electrical vehicle" its market share is depending upon the consumer behavior.









homemaker sector. Young generation and business man are the major chunk of the pie, rest is salaried and homemaker. If we talk about the choices and preference of young generation [students] here they are updated and connected regularly on the Internet and social media to exchange the information and views. They are the new breed of generation who is tech savvy and need more hi-tech features in the gazettes to be use in their life. They are ready to use new technology, electric vehicle are new technology in the market with high end features. Businessman are having their different choices in terms of car choosing, their decision depending upon the usage of car, like family use, business usage etc. according to the author, it is a good mix of respondents to get the views and reviews for the electric car in Indian Market.

**Q4.** Is related to the marital status of the respondents, there is a difference in the opinion of married and unmarried people when they respond to the questions in the survey. Married people has different set of views about the product like here is the car to be purchased or already owned by the respondent, married people will go to its features like fuel consumption, price, size etc. unmarried people has different views on the same product here if unmarried person or respondent is female than color, shape, looking like external beauty will attract her attention and that will drive her to force or advocate the car which is good looking and beautiful. In this question, about marital status of the respondents we have 44.87% of unmarried people and 55.12% of married people. This is almost half of the respondents with no major difference in terms of population distribution of respondents. According to the author, the views of the respondents will certainly match according to the population distribution.

**Q5.** Is related to the **monthly family income**, here the point is the monthly income is of family combined. There is no bifurcation of family income between father, mother or children some of them are earning and some of them are not. Although it gives us a clear divination on the scale what is mentioned on the survey question. 44.73% of respondents are coming under the monthly family income of 1- 10 Lac, that infers many of the family members are into earning position. Secondly, in 81 – 1 lac range around 40.78% respondents. It seems that majority of the respondents have abundant amount of disposal income and they can think of purchasing a new car or think of exchange scheme if car dealers are offering to them. The next income slab is of 51 – 80 K it is 13.15% of respondents they can buy a new car with the help of taking loan from a bank or take the benefit of any government scheme. According to the budget 2019, the finance minister has said that there will be discount on the income tax of 1.5 lac if the person has taken loan on the purchasing of electrical vehicle till 2023. The power of combine family income and government incentives there is a hope that the new entry of electrical vehicle will mark its presence in the market. As the majority of population of respondents are tax payer or at least filling their income tax returns they can have the benefit of the same. The rest of population of the respondents 1.31% are of above 15 lacs, they can benefit of the government schemes but if they are

taking the benefits in real sense it is a matter of further research. According to the scope of current research, it is clear that this small part of the population is able to purchase high end electrical vehicle.

**Q6.** Is related, this question ask about the respondents about the car that they have already bought and using. Asking this question is important and necessary that author will get to know which brand is popular in the market and respondents choice of vehicle. Secondly, the brand image of the car brand it is one of the important factor in making the choice and it is correlated that if the particular brand has more presence in the market that will build the mindset of the people for buying the next car of same brand, after sales and spare part availability of the particular brand is somewhat easy in comparison to the other brand who has limited presence.

According to the respondents, 82.75% are using Maruti Suzuki, 32.75% are using Hyundai, 31.03% are using Honda, 15.51% using Toyota, 10.34% are using Tata rest ranging from 1- 3% are using Mahindra, Datsun, Renault, BMW, Audi, Jaugar etc. it is evident that Maruti Suzuki is on the top of the list of choice. Honda and Hyundai are having good market share and others are also have their presence according to the choice and preferences of the respondents.

This is the picture the author got after analyzing the result of Q6, in later question the author will get to know that how many wants to switch their brand if there are incentives from government or market.

**Q7.** Is related to the loyalty to the same brand, 48.052% are ready to change their brand, 38.96% are not sure, 09.09% are 100% sure that they will go for new brand and 3.89% are not shifting from their previous brand, they are loyal customers to the brand.

Looking at the data of Q7, it is evident that people need a change, although Maruti is top preference of customers and market leader Honda and Hyundai were not in the market in earlier times the change factor works every time that why they are into the picture with combined market share of 46.54% it is a big chunk of the market pie. Similarly the new entrant “electric cars” with government incentives will certainly catch the attention of potential buyers in the market. If we talk about the segment “I would like to change the brand” but not 100% these are the people who require incentives, discount or some motivation to finalize up to 100% yes they are ready to change but with certain conditions like incentives.

**Q8.** Is related to the purpose of the car, it is a very simple question about the usage of the car. 79.48% population of respondents are using car for the family usage, 65.38% are using for personal usage, 39.74% are using for business purpose, 5.12% are using for other purpose. It is evident that car is used for family and personal use when they are not with family. This gives a reflection that the size of the car is one of the important factor while purchasing a new car, as it is very clear from the fact that maximum usage of the car is



for family purpose the size of the car plays an important factor in that. When it comes for the usage of cars the fuel consumption and millage of the car is also another important factor.

**Q9.** Is related to a typical marketing type question, sources of information for buying a new car. The population of respondents choose 80.23% of friends and relatives, 75% choose Internet / Social Media, 61.84% of T.V. and media advertisements, 60.52% Print media, 25% auto expo, 18.42% car magazines and 14.74% go to car dealers' rest 5.26% get information from pamphlets.

The maximum percentage of getting information is from friends and relatives and Internet/ Social Media population of respondents are tech savvy and their friends and relatives are either using same brand of the cars or thinking of buying a new car and they rely on these two factors for the information. Through their experiences or reviews new car buying decision making can be shifted to their choices or they can have ample amount of the information to make the decision to buy the new car. Friends, media are important factors in deciding time to purchase any product from long they have strong influence. Nowadays, Internet and social media has stronger influence over decision making and up to what extent it is a matter of further research which is beyond the scope of the current research.

**Q10.** Is related and somehow extension of previous question, in response to the question whose views and suggestions are significant in making the decision of new car- 68.38% chooses their own suggestions/ views, 63.63% choose their friends and relatives, 46.75% choose wither husband or wife's, 45.45% agrees to the car sales person, 42.85% consult to their parents. Ironically 0% in terms of son/ daughters like their children. In this question the response of the respondents are very clear in terms of friend and relatives suggestions and their own decision. The own decision could be based on the views and suggestions of other components like parents and husband or wife.

Decision making process is a complex process that involves many factors and while choosing a new car in which each factor has its own degree of involvement makes it more complicated.

**Q11.** Is related to the factors / features of the car that helps in deciding the buying of a new car. The population of the respondents choose **price** of the car at number one with 83.11%, 79.22% chose **fuel consumption**, 71.429% give their preference to the **size** of the car [sedan/hatchback], 64.93% choose **latest technology/ features**, 58.44% picked **after sales services**, 55.84% indicate **brand image**, 48.05% give their vote to power, 42.85% indicate **looking**[external/internal features], 40.26% selected **safety** as deciding factor, 18.18% choose **on road maintenance**, 18.18% select **color** of the car, 16.88% indicate **spare part availability**, 12.98% choose **discount** offered from 6 – 9% exchange offer, loan offer and **loyalty** benefits are counted.

This question is the core of decision making factors, Indian market is a price sensitive market and according to the

respondents price is number one concern in the process of buying a new car. The second important factor is fuel consumption and the related factor of millage is associated with it. Another important factor is size of the car, as from the previous question from the survey the usage of the car people are using car for family and personally. The latest feature has higher percentage than brand image, this is an interesting point when people are tend to change the brand usually this comes at higher scale. In previous question in the survey it is clear that people want to change to newer brand. There are brand loyal customer but at the same percentage as in previous [Q7] asked question with response 3.89% are not shifting from their previous brand, they are loyal customers to the brand.

**Q12.** Is associated to future of electrical vehicle in India, the respondent population selected majorly two options, first with 76.623% - *EV [Electrical Vehicle] will be a part of Indian transport system but will not completely replace ICE [Internal Combustion Engine] vehicles.* Secondly, with 68.831% *EV [Electrical Vehicle] at early stage will be costly and have service issues, later they will have greater acceptance.* Furthermore, other two options were with 9.091% EV [Electrical Vehicle] will completely replace ICE vehicle in coming years and with 11.688% EV [Electrical Vehicle] will be a research project for replacement for ICE vehicles not used by masses.

It is evident that, people are very clear with the future of electrical vehicle in India that electrical vehicle will be the part of Indian transport system and they are also clear with the fact that electrical vehicle are costly at earlier stage by the time by the time they got acceptance by masses they will be in approach of the common people. This option is also supported by Indian government in the budget 2019 about the incentives and tax relaxation. This step will certainly help the market [manufacturers and customers] to accept the electrical vehicle in Indian transport system. Altogether the future of electrical vehicle seems to be bright in coming future.

**Q13.** Is associated to reduction of driving cost, it is framed like this to have the views of respondents - EV [Electrical Vehicle] will reduce the cost of driving if yes, than kindly choose the percentage reduction that will motivate you to switch from ICE to EV. It means that up to what percentage of reduction of driving cost will motivate the customer to move from ICE [Petrol/ Diesel] vehicle to Electrical vehicle. The response to this question the option selected by the respondents with 85% - 100% reduction is 62.338% and with 25% - 35% reduction is 16.883% and for those who want the reduction between 50% - 75% is 12.987% and for 10% - 15% the respondents are 7.792%.

As it is evident from the response of Q 11, with 79.22% chose **fuel consumption** as second important factor in deciding the car purchase. In the current question about the reduction in driving cost and they want maximum reduction in comparison to fuel driven cars. As the fuel is becoming costlier day by day and on one time it will not able to fulfill the need of people to refuel their vehicle as it is finite. Fuel consumption/ millage/ economy these are some common



factors that are kept in the mind of the customer while making decision to buy a car.

**Q14.** Is associated to the above question, if the customer is ready to shift over electrical vehicle with high percentage of driving cost reduction than how much customer is willing to pay more on EV over ICE vehicle. Everything has its cost, if you need a better performance than you need to pay the prime price. The acceptance of LPG/ CNG driven vehicles are due to the same reason to cut down the driving cost.

The response to this question, the respondent population selected maximum with 80.519% - upto 10%, upto 25% is selected by 12.987%, upto 50% by 5.195% and upto 100% by 1.299% of population.

It seems that maximum number of respondents are **not willing to pay more** than 10% of extra cost. Others lies in between upto 25% is 12.987%, that is somewhat noticeable and rest is negligible, it is very clear that people do not want to pay more they want the electrical vehicle upto or nearby cost of current ICE vehicle. This could be achieved in long future when there is a greater acceptance of electrical vehicle on road and the parts used in electrical vehicle come down to at its lower cost.

From the data above the people are having the mindset that they have to pay a bit more to avail the facility of electric vehicle and side by side they do not pay more than 10% extra cost. This question can be helpful to the car manufacturers to understand the mindset of people while deciding the cost of the vehicle or this could give them an idea that they have to reduce the price of the electrical vehicle nearby the ICE vehicle and they have to find the correct measure to do this like by availing the government incentives or decide to make it rather to import it.

**Q15.** Is associated to identifying the bottleneck in the journey of electrical vehicle to the road from showrooms. Why people will not prefer EV over ICE driven vehicles in India. It is a straight forward question to know the intentions of respondents what is/ are the most possible reason due to which people will avoid electrical vehicle. The respondent with option Not interested in purchasing new car is with 6.410%, respondent with 35.897% selected - EV are expensive than traditional ICE vehicles, with 38.462% are concern with Lack of charging Infrastructure/ facilities, with 30.769% opted- Higher maintenance cost over ICE vehicles and with 52.564% percentage selection of - Lack of after sales services/ trained staff, the option with - as it is a new product in the market. It takes more time in charging at home and it will increase the electricity bill 71.795%, the option with - Time consuming process at public charging stations 69.231% and the option most selected is - Sense of insecurity in long drives 73.077%.

People use the car for family and business purpose and it is evident from the selection of the option the sense of insecurity in long drives people do not want to take risk with family driving on long journey as due to initial phase of the electrical vehicle and charging infrastructure. Another bottleneck is the electricity bill due to charging the vehicle

as it took long time to charge at home and it will add the electricity cost to the electricity bill of the consumer. Third most selected option is time consumed in public charging even the customer at the first place it will take the required amount of time while driving the long journey. Next bottleneck in the journey of electrical vehicle is the lack of service/ trained staff, to maintain electrical vehicle up to its best performance level will require a trained staff in the initial phase of electrical vehicle in the market it will be difficult to find out the proper trained staff for maintenance. Other hurdles are lack of charging stations and the cost in comparison to the traditional ICE vehicle.

Looking at the responses the people are worried about the facts that seems more prominent at the initial phase and it is true too. But with the time these problems are going to vanish, in many countries who are using electrical vehicle are providing proper infrastructure for charging the vehicle and other facilities to help people who are using electrical vehicle. Looking at the bigger picture of having pollution free environment and green future these initial problems have to be taken care by the government, car manufacturers and other people who can do a startup in rectifying these problems. By looking at the many initiatives taken by central and state government of India it will be solved in near future.

**Q16.** Is associated to asking about the effect of using electrical vehicle on environment, the respondent majorly with 98.701% agree to the use of electrical vehicle will have positive effect on the environment and will lead to green future.

**Q17.** Is associated to buy an Electrical Vehicle [car] in near future, the respondents are ready to buy with 96.104% as yes. This is again a good sign for the market and Green India that people are having positive mindset even by knowing the initial bottlenecks towards the journey of electrical vehicle to the road.

Selecting "YES" as an option will certainly boost the confidence of car manufacturers to look into the promising new car segment and new business opportunity to explore where buyer has positive mindset over the product.

**Q18.** Is associated to Government incentives to motivate people for buying electrical vehicle, the respondents selected "yes" with 98.718% percentage. It depicts that people want to intervene government to provide support at initial phase to motivate the car manufacturers as well as the customers so that people are encourage to purchase electrical vehicle.

Many things are depending upon the government policies like taxation, import and export policies etc. For example the battery used in the electrical vehicle are most important part and it is mostly imported and this increases the cost of vehicle. If due to some changes in government policies the import duty or some other taxes could be lowered than the cost of electrical vehicle come to an affordable cost.

In the current budget of 2019, Indian government has shown some positive signs to do that.



**Q19.** Is associated to Government incentives or efforts to cut down the on road cost of Electrical Vehicle, the respondents selected the maximum – that Reduction in GST should be there with 88.462% percentage, next to it is that Government should lower the import duty with 79.487% percentage, followed by Tax benefits with 78.205% percentage, next most opted is Indigenous manufacturing of parts like Battery etc. 73.077% percentage followed by Exchange schemes with 39.744% percentage.

The population of respondents has made it clear that reduction on GST will have considerable amount of effect on the cost, as GST is the single tax effectively all over India on selling products and goods. Followed by import duty as battery is mostly imported from outside India and it cost max. of an electrical vehicle. People are also concerned with tax benefits and exchange schemes.

In the 2019 budget, Indian government has made it clear that there will be reduction in GST and there will be tax benefits on the loan taken for the purchase of electrical vehicle, import duty reduction I again a decision to made by government it may be done in near future depending upon the stress of market demand furthermore, the exchange schemes on the purchase of the car is depending upon the car manufacturers and dealers as to sell new product in the market they can give this option although in present scenario car dealers are floating these kind of schemes time to time to boost the business.

## XI. CONCLUSION

To conclude the research paper, the author has written many research papers in which the study leads to a definite conclusion based on the facts. In this research paper there are facts, figures and information, anticipation, bottlenecks, solutions, green future aspects, government policies, market factors, buyer's decision making, the factors affecting buyer's decision making, facts and details of the countries who are already using electrical vehicle and their policies and incentives to the car manufacturers and its users.

This research paper has it all, all the market driven forces to build the upcoming market for electrical vehicle. The major component in the present research is the buyers government can provide incentives and schemes the car manufacturers and dealers can provide the discounts and offerings to attract the buyer the ultimate deciding factor is the buyer's perception about the product. To understand this the author has designed the set of questions and the respondents who made response to the questionnaire are come up as perfect mix and match to draw the conclusion. The age group is the mix of young and established respondents, the respondents are having optimal mix of gender they are having perfect mix of occupation evenly balance status of marriage like almost 50-50 % these factors will help in deciding the conclusion to its best. Furthermore, there is a balance mix of family income this is one of the most important factor as according to the occupation and family income people can have disposable income to be spent on the purchasing electrical vehicle. The respondents are already using cars, they are well aware of pros and cons of driving a car most

of the respondents are ready for change, this is a positive sign that will the help the market there is clear understanding about the usage of the car mostly for family usage. Moreover, the sources of information are friends and relatives, print, TV and internet these are mostly those factors that help in making the decision about the product. The features like price, fuel consumption and size of the vehicle are important likewise this will decide the future and anticipated response from the respondents is that electrical vehicles will be the part of system but not able to replace IEC vehicles completely other than this they will have initial problem in acceptance but with time it will go. Respondents expect from the electrical vehicle that they will reduce the cost of driving and they are ready to pay some extra price if they do. The main issue in accepting the electrical vehicle on road the reason came up is sense of insecurity in long drives as people take car for family purpose and this is a perfectly valid reason other reasons are charging time and cost of electricity along with lack of infrastructure for after sale support, according to the author these are the grey areas where the car manufacturers and dealers and government should take serious interest. People are ready to buy the electrical vehicle in near future if they are provided by some incentives like tax rebate, GST reduction and lower import duty to cut down the cost of the vehicle and exchange schemes. Altogether the detailed study come to the point that people have positive feelings about the electrical vehicle and they have the mind set to buy the same provided some basic infrastructural support to remove the bottlenecks like sense of insecurity.

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