AN ANALYSIS OF IMPACT OF ELECTRIC VEHICLE ON ENVIRONMENT

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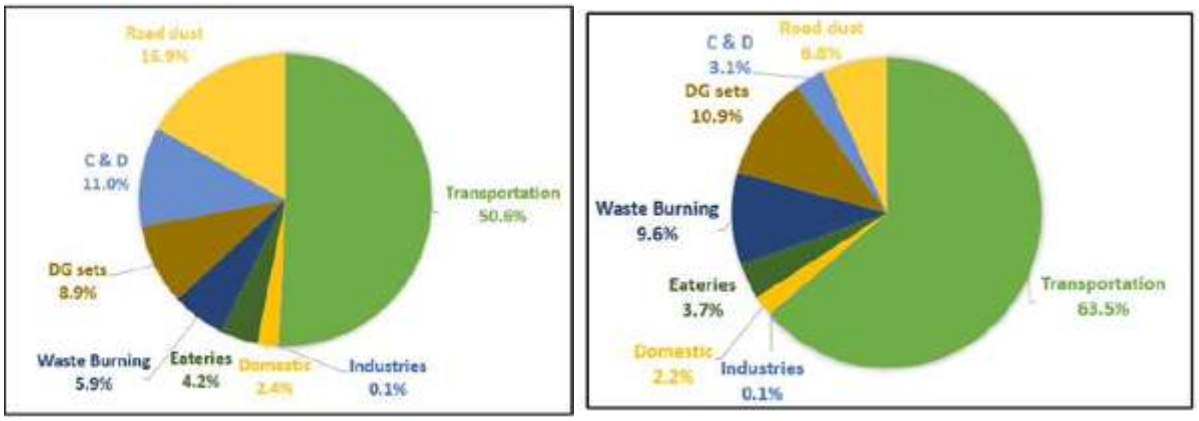
INTRODUCTION:

Pollution, the major problem faced by the humans. It refers to the pollutants released into the environment causing problems to human health and planet. According to world health organization, air pollution is responsible for millions of deaths which is several times more deaths than AIDS, Malaria, COVID-19 pandemic. They stressed that most of the human beings are breathing the air that exceeds the WHO's guideline limits for pollutants. The summarization given by state of global air report states that in 2020, 4.5 million of deaths are linked to outdoor air pollution and another 2.2 million deaths are caused by indoor air pollutions. This report gives you sobering reminder that the climate is worsen with more air pollution problems. The causes of air pollutions are vehicular emissions, industrial activities, construction dust, biomass burning, and agricultural practices. All these air pollutants intensify heat and increase ultraviolet radiation. Besides, climate changes also increase allergic air pollutants like mold (which increases the floods) and pollen(due to longer pollen season). In addition, the other problem is wild fire smoke caused by high temperature that lingers for days and pollute the air.



Sectoral PM2.5 and PM10 emission load and its spatial distribution over KSPCB

The above graph clearly indicates that the major pollution is caused by transportation which is 50.6%. As these vehicles are polluting the environment it is replaced by electric vehicles. An electric vehicle has zero emission, the electricity to charge their batteries are cheaper than fossil fuels like petrol or diesel, eco-friendly etc., This study evaluates the impact of electric vehicles on environment which encourages to use the technology.

OBJECTIVES:

1. To study the number of electric vehicles increased in past 5years
2. To know key drivers that motivated to purchase an Electric vehicle (environmental benefits, cost savings, convenience and driving experience)
3. To study the impact of the electric vehicles on environment.
4. To examine the hypothesis that the electric vehicles has zero emission and hence do not cause any pollution

METHODOLOGY:

METHODOLOGY	
RESEARCH DESIGN	Exploratory
DATA COLLECTION	
PRIMARY DATA	KARNATAKA STATE POLLUTION CONTROLS BOARD
SECONDARY DATA	Websites Of Pollution Control And Rto Office
STUDY PERIOD	5 Years

SAMLING AREA	Kasturi Nagar RTO, RV college of engineering Kengeri, HSR layout new central silk board, NTTF Peenya industrial area
STATISTICAL TOOLS	Regression and Correlation

- The study is exploratory study where we are trying to explore the decrease or increase in pollution after introduction of electric vehicles.
- The data is collected from primary and secondary sources. The primary source includes observation collection method where the data is collected from Karnataka state pollution controls board (KSPCB) and data of electric vehicles are collected from various showroom. The data is used to analyse how the pollution has changed from past 5 years. The data of electric vehicles helps to know how many people are using electric vehicles. The secondary data was by collected for past 5 years data from pollution control board and electric vehicles show rooms.
- The sampling areas are Kasturi Nagar RTO, RV college of engineering Kengeri, HSR layout new central silk board, NTTF Peenya industrial area, Bangalore. From these four places we are going to collect the pollution data which includes SO_2, CO, PM 2.5, PM10 etc., in addition we are going to collect number of electric vehicles that are sold out in that particular area. This helps to check the relation between number of electric vehicles and pollution.

	SO2	**CO**	**PM2.5**	**PM10**
2020	2 ppb	1 ppb	32 $\mu g/m^3$	25 $\mu g/m^3$
2021	2 ppb	73 ppb	32 $\mu g/m^3$	64 $\mu g/m^3$
2022	2 ppb	293 ppb	31 $\mu g/m^3$	66 $\mu g/m^3$
2023	2 ppb	329 ppb	28 $\mu g/m^3$	41 $\mu g/m^3$
2024	3 ppb	387 ppb	24 $\mu g/m^3$	54 $\mu g/m^3$

Micrograms per cubic meter (µg/m3), parts per billion(ppb)

- There are a greater number of companies which are manufacturing electric vehicles. Among them we are selecting the companies whose branches are in Kasturi Nagar RTO, RV college of engineering Kengeri, HSR layout new central silk board, NTTF Peenya industrial area, Bangalore. The type of data selection is cluster type of sampling.In the sampling technique we are dividing

the population into clusters and then randomly selecting clusters for sampling

- The data will be collected for 5 years (2019-2024). As the FAME (Faster Adoption and Manufacturing of Electric vehicles) (II phase) has started, a revolution to decrease the pollution in Bangalore.
- The statistical tools used are regression and correlation, to check is there is a relation between the decrease in pollution due to increase in electric vehicles.

CONCLUSION:

By replacing the electric vehicles with traditional vehicles, we can lower greenhouse gas, noise pollution etc. In urban areas, where air pollution is a major problem due to vehicles can be solved by introduction of electric vehicles. The exhaust emission from the vehicles includes pollutants such as CO, SO_2, PM2.5, PM10 etc. By introducing electric vehicles can improve air quality which reduces incidences like respiratory diseases, cardiovascular problems and other issues related to human health and environment.

It is difficult to say that increase in number of electric vehicles will reduce the negative impact on environment. The study was sure that when population switches to electric vehicles the quality of life will increase. This is due to the purification of air from harmful gases. The positive impact of electric vehicles increases when the electricity was generated from renewable energy. Besides, successful recycling of batteries also gives positive impact on the environment.

The causes of pollutions are many which include vehicles, factories, burning plastic and tyres. The smart start to reduce the pollution is conversion of traditional transportation to electric vehicles. The change in air quality will not increase immediately but the quality of air would have increased. Many efforts like this may increase in these areas the quality of air and our quality of life.

FUTURE SCOPE:

My study focused on pollutants like CO, SO2, PM2.5 and PM10 Further studies can be done on:

Battery Technology: Electric vehicle batteries are made of lithium ion which involves materials like lithium, manganese, cobalt, nickel and graphite. The further study can be done Electric vehicle batteries.

Environmental studies: By using Electric vehicles, tailpipe emission can be

decreased. When electric vehicles are powered by renewable energy like solar or wind can decrease the carbon footprint.

Market growth: The study can check the relation between increase in number of electric vehicles and its impact on market growth.

EV Variants: The study can focus on different electric vehicles which include car, auto, bus etc and its impact on environment