

Visualization Tool for Electric Vehicle Charge and Range Analysis

1. Introduction

1.1 Overview

A vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged from an external source and have an electric motor instead of an internal combustion engine.

1.2 Purpose


The Electric Vehicle (EV) is not new, but it has been receiving significantly more attention in recent years. Advances in both EV analytics and battery technologies have led to increased automotive market share. However, this growth is not attributed to hardware alone. The modern mechatronic vehicle marries electrical storage and propulsion systems with electronic sensors, controls, and actuators, integrated closely with software, secure data transfer, and data analysis, to form a comprehensive transportation solution. Advances in all these areas have contributed to the overall rise of EV's, but the common thread that runs through all these elements is data analytics.

The new EV's are combined Electrical storage and propulsion systems with electronic sensors, controls, and actuators, integrated closely with software, secure data transfer to form a comprehensive transportation solution.

2. Problem definition and design Thinking

2.1 Empathy Map

Template



Empathy map

Use this framework to develop a deep, shared understanding and empathy for other people. An empathy map helps describe the aspects of a user's experience, needs and pain points, to quickly understand your users' experience and mindset.

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Build empathy

The information you add here should be representative of the observations and research you've done about your users.

Says
What have we heard them say?
What can we imagine them saying?

- It's expensive but worth for money
- Impressed with the advance technology
- Safe and does not burn fossil fuels
- The efficient battery life
- Uses the car for work
- Charging the battery at home
- Charging at home because the lack of charges on the country side
- Road trip with family

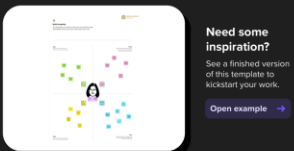
Does
What behavior have we observed?
What can we imagine them doing?


Thinks
What are their wants, needs, hopes, and dreams? What other thoughts might influence their behavior?

- Very reliable
- Worries about range
- Is this autonomous driving available ?
- Considerate of the enviroment
- Safe
- feels comfortable
- In control
- Assured with the quality

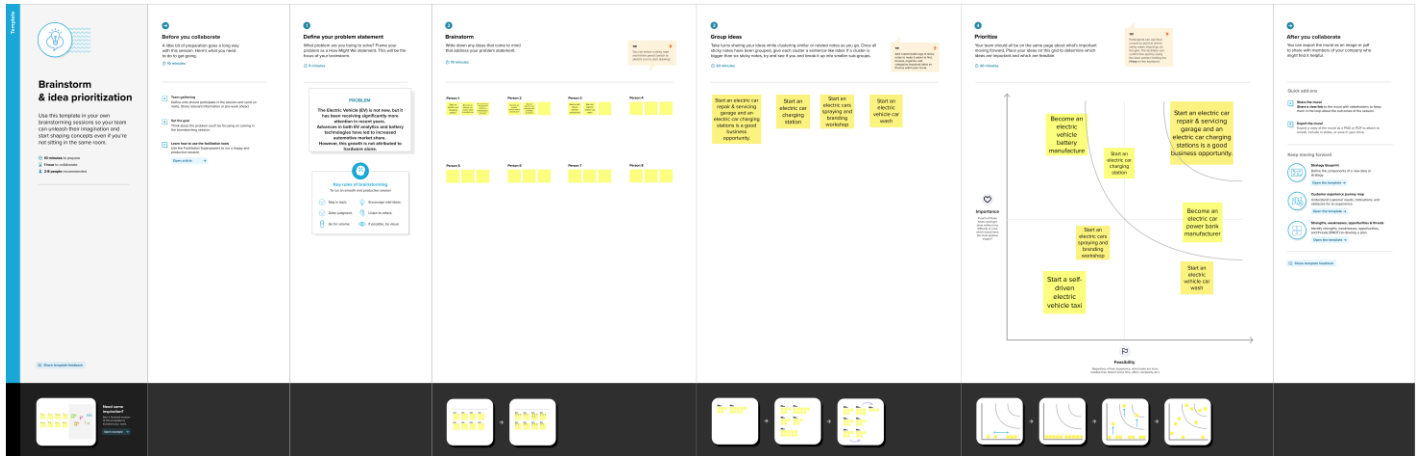
Feels
What are their fears, frustrations, and anxieties? What other feelings might influence their behavior?

Consumer



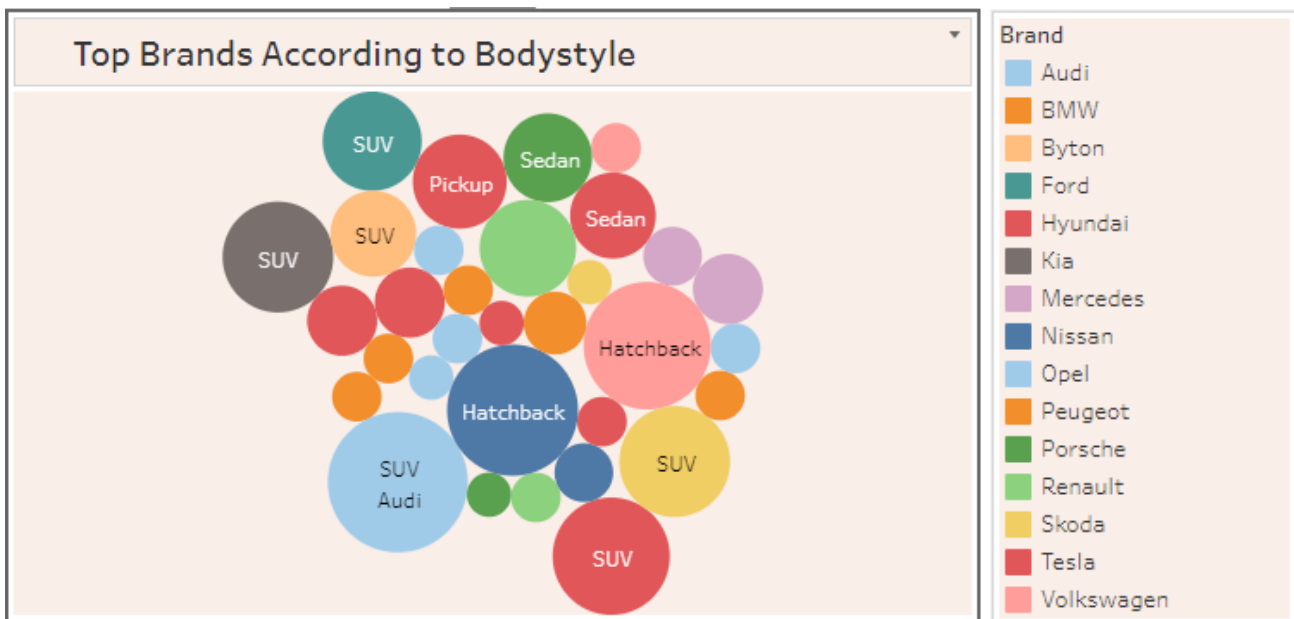


2.2 Ideation and Brainstorming Map



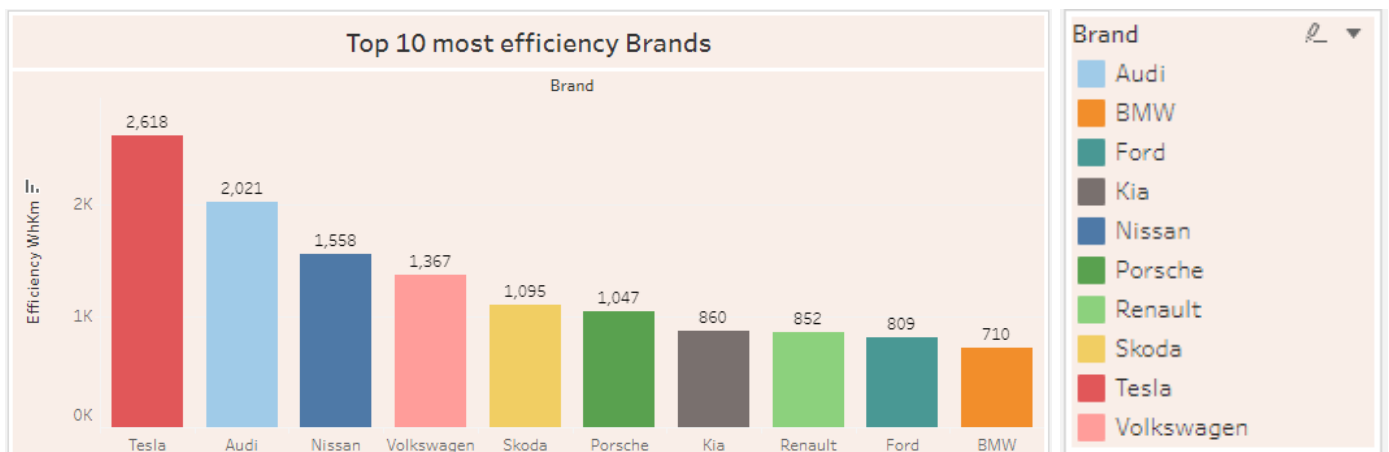
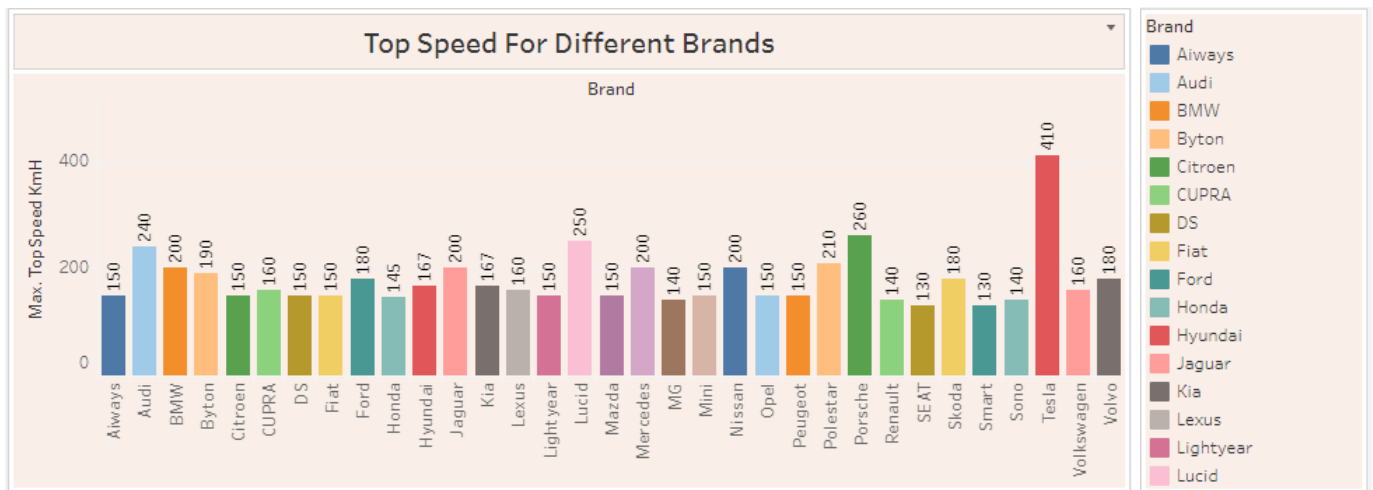
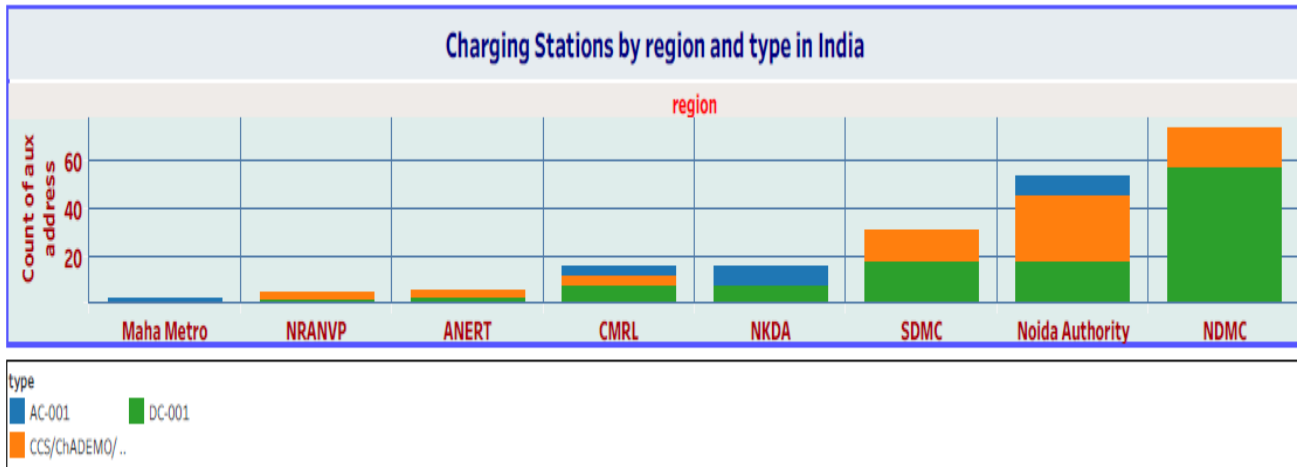
3. Result

3.1 Electric Cars Charge and Range Analysis Dashboard



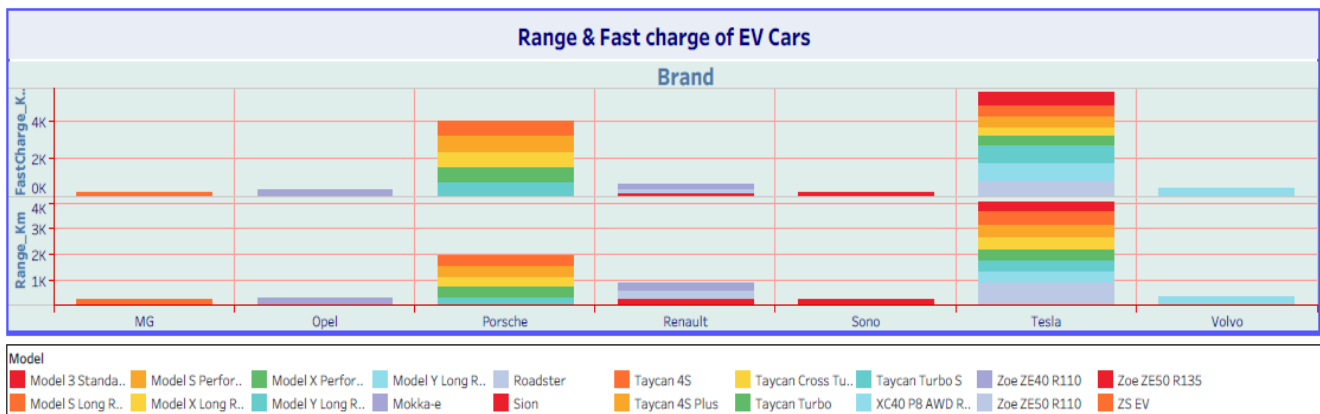
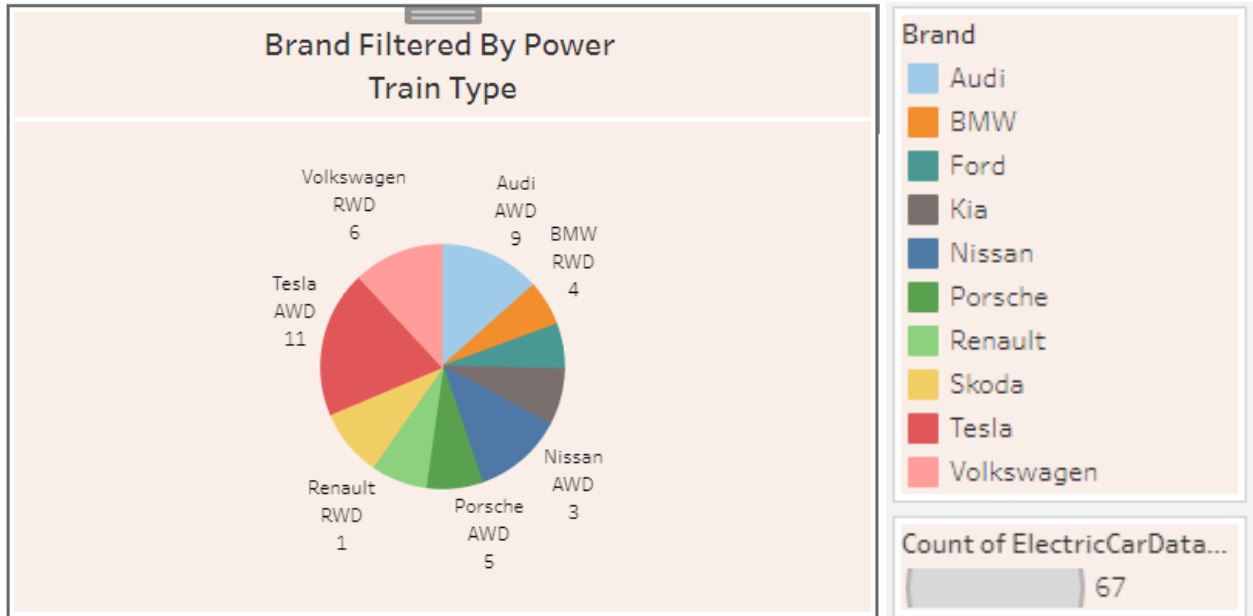
Project Report

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Project Report

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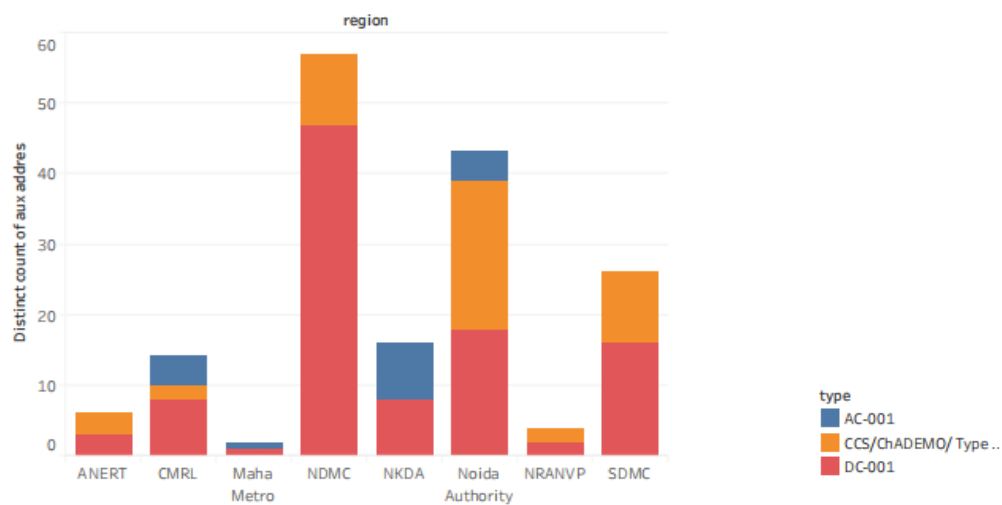


3.2 Story of Electric cars in India

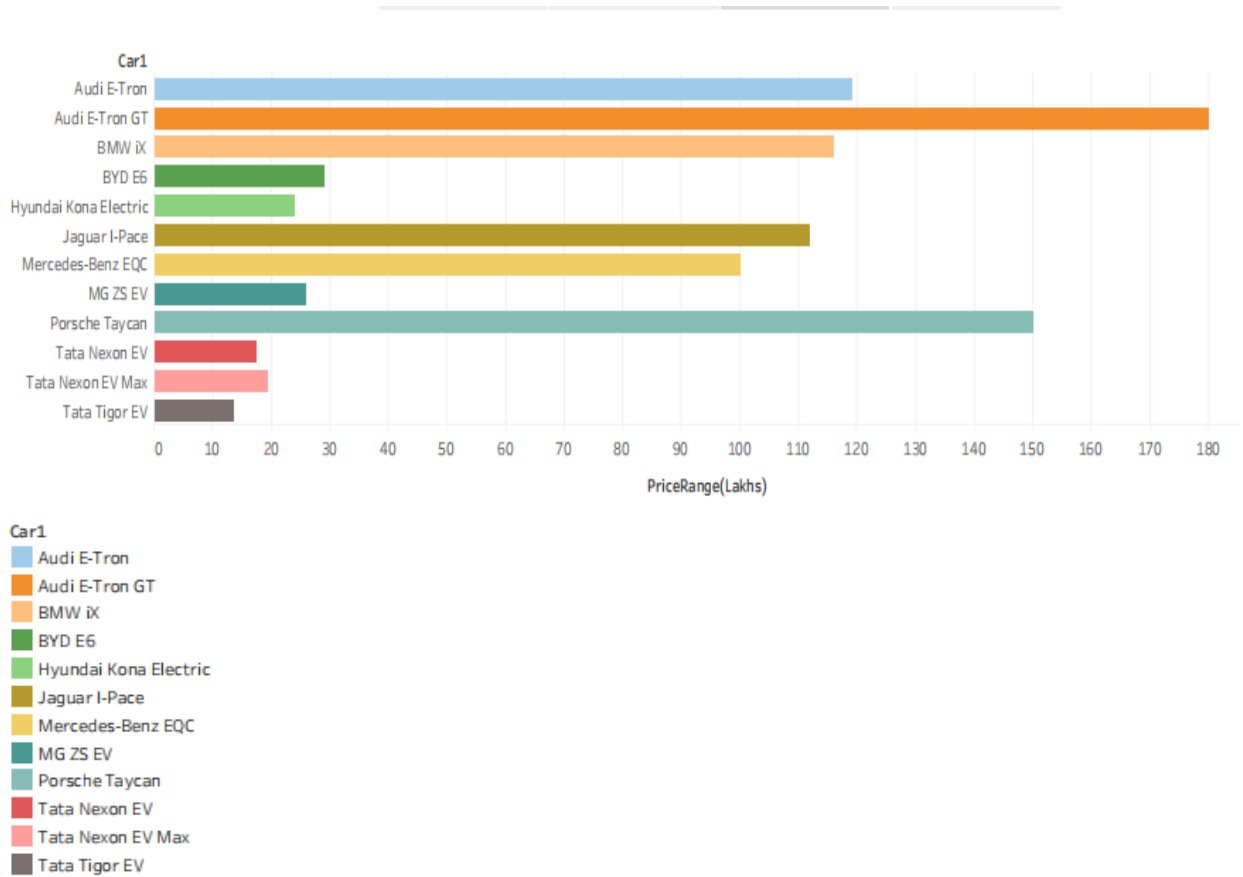
A. Charging Stations in India



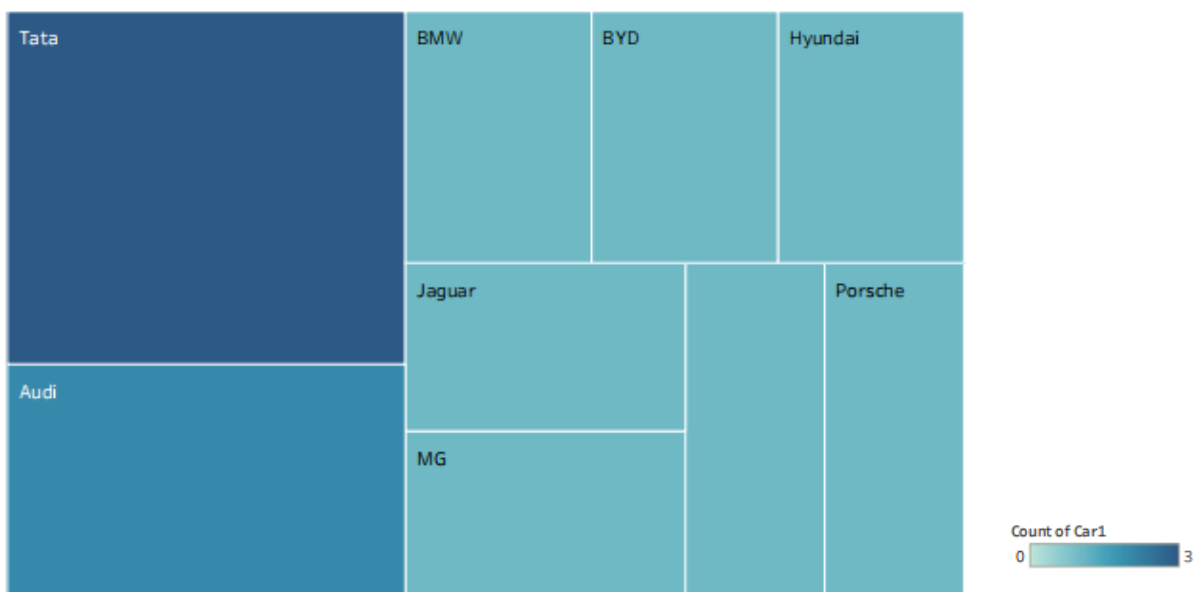
B. Charging Station by region and type



C. Price of Electric cars by different brands



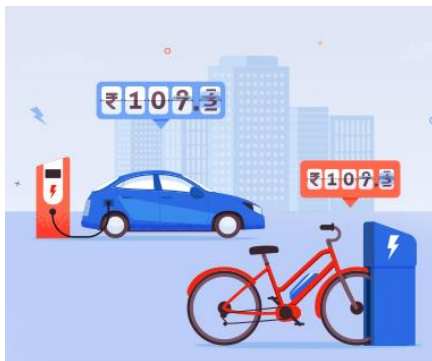
D. Different Brands and No of Models



4. Advantages Of Electric Vehicles

Transport is a fundamental requirement of modern life, but the traditional combustion engine is quickly becoming outdated. Petrol or diesel vehicles are highly polluting and are being quickly replaced by fully electric vehicles. Fully electric vehicles (EV) have zero tailpipe emissions and are much better for the environment.

A. Lower running costs



- The running cost of an electric vehicle is much lower than an equivalent petrol or diesel vehicle.
- Electric vehicles use electricity to charge their batteries instead of using fossil fuels like petrol or diesel.
- Electric vehicles are more efficient, and that combined with the electricity cost means that charging an electric vehicle is cheaper than filling petrol or diesel for your travel requirements.
- Using renewable energy sources can make the use of electric vehicles more eco-friendly.
- The electricity cost can be reduced further if charging is done with the help of renewable energy sources installed at home, such as solar panels.

B. Low maintenance cost



- Electric vehicles have very low maintenance costs because they don't have as many moving parts as an internal combustion vehicle.
- The servicing requirements for electric vehicles are lesser than the conventional petrol or diesel vehicles. Therefore, the yearly cost of running an electric vehicle is significantly low.

C. Zero Tailpipe Emissions



- Driving an electric vehicle can help you reduce your carbon footprint because there will be zero tailpipe emissions. You can reduce the environmental impact of charging your vehicle further by choosing renewable energy options for home electricity.

5. Disadvantages of Electric Vehicles

- Higher Purchase Cost. Compared to regular automobiles, electric vehicles are highly pricey.
- Low Speed and Range.
- Low Price on Selling.
- The Inconvenience of Service Station.
- Low Energy.
- Battery Expenses.
- Slow Charging.
- Expensive Recharging Options.

6. APPLICATIONS

- Electric vehicles use electricity to charge their batteries instead of using fossil fuels like petrol or diesel.
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7. CONCLUSION

- The progress that the electric vehicle industry has seen in recent years is not only extremely welcomed, but highly necessary in light of the increasing global greenhouse gas levels.
- As demonstrated within the economic, social, and environmental analysis sections of this webpage, the benefits of electric vehicles far surpass the costs.
- The biggest obstacle to the widespread adoption of electric-powered transportation is cost related, as gasoline and the vehicles that run on it are readily available, convenient, and less costly.

8. FUTURE SCOPE

- Most Indian buyers believe that an electric vehicle will be ready by 2023, but the majority also believe that it would no longer be available until 2025. Consumers in India are looking for a lower price for EVs than those in other countries, with the global average tipping price for EVs being \$36,000. (around Rs27 lakh).
- The cost of lithium-ion batteries is roughly \$250/kWh globally, which translates to approximately Rs5.7 lakh in battery prices alone. Currently, lithium-ion batteries account for half of the cost of an electric vehicle, making them more expensive than conventional vehicles.
- The safety of the batteries against explosion serves as a stumbling block for Li-ion batteries. Charging is a significant barrier for EVs in India, and a lack of charging stations may also be considered, rendering them impracticable or significantly less feasible for long-distance rides.