iJRASET
International Journal For Research in Applied Science and Engineering Technology



# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

**Volume:** 9 **Issue:** VII **Month of publication:** July 2021

**DOI:** https://doi.org/10.22214/ijraset.2021.37133

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
*ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429*
*Volume 9 Issue VII July 2021- Available at www.ijraset.com*

# Electric Vehicle and its Types

P. M. Tripathi[1], Dr. Anurag Shrivastava[2]
[1, 2]*(Singhania University)*

***Abstract:*** ***Electric vehicles are an important option for reducing greenhouse gas emissions. Electric vehicles not only reduce dependence on fossil fuels, but also reduce the impact of ozone-depleting substances and promote widespread adoption of renewable energies. Despite extensive research into the properties and characteristics of electric vehicles as well as the nature of their charging infrastructure, electric vehicle construction and grid modeling continue to evolve and become limited. regime. This paper presents market penetration surveys for electric vehicles, hybrid electric vehicles, plug-in hybrid electric vehicles and battery electric vehicles, and describes optimal engineering and modeling approaches. their differences. Research on critical barriers and inadequate charging equipment targets developing countries like India, which makes the study unique. The development of the new Vehicle to Grid concept has created additional energy sources when renewable energy sources are not available. We conclude that considering the specific characteristics of an electric vehicle is important in the mobility of the electric vehicle.***

***Keywords: Electric vehicles Vehicle to grid Optimisation technique CO 2 reduction***

## I. INTRODUCTION

With the rapid expansion of the Indian auto market, electric vehicles (EVs) are emerging as a promising vehicle for improving air quality, energy security and economic opportunities. The Government of India recognizes the urgency of finding sustainable mobility solutions to reduce dependence on imported energy sources, reduce greenhouse gas emissions and mitigate the negative impact of transport, including global warming. Carbon dioxide emissions can be reduced by taking preventive measures to mitigate the catastrophic climate change that threatens this global species. Great efforts have been made to reduce the use of fossil fuels to generate electricity, promote transport, reduce energy consumption and protect carbon sequestration. Electric vehicles could be an alternative to reducing carbon dioxide emissions

*1)* Though the use of EVs has begun, people are still depending upon fossil fuel powered vehicles. However, the EVs are facing challenges on basis, we estimate that the av- erage CO 2 is measured over the life cycle of a vehicle rather than over a vehicle. The total CO 2 emission over its full life time varies significantly depending on the power source where the vehicle is manufactured and driven

*2)* Harmful emission from the transport sector, and investment by dif- ferent OEMs, there arises a concern for growing more and low cost EVs in the forthcoming years. Several factors such as technological advance- ment, reduction in the cost of a vehicle, Govt policy support, vehicle purchasing incentives, parking benefit, and good public charging infras- tructure facility could result in the uptake of EVs in India. As production of EV is very low in overall Indian market.

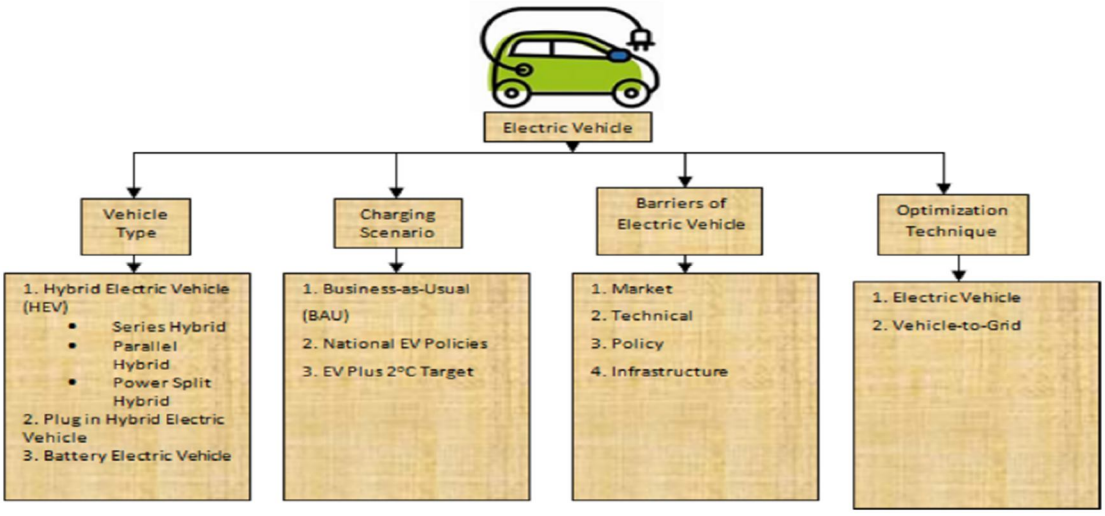



**Fig. 1.** Overview of the Electric Vehicle.

©IJRASET: All Rights are Reserved

*ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429*
*Volume 9 Issue VII July 2021- Available at www.ijraset.com*

## II. TYPES OF ELECTRIC VEHICLES

Several countries have developed the EVs, but the broader market of EVs comes from China, UK, USA, and Germany. The EV market is growing remarkably across the world. The vehicles can be arranged into three groups:

### *A. Hybrid electric vehicle*

A hybrid electric vehicle consists of a heat engine and an electric motor. Here, the battery is charged by a motor and energy is generated during deceleration and braking. In the current scenario, it is called a hybrid vehicle because it combines an internal combustion engine and an electric motor as a power converter.

Hybrid electric vehicle technology is being rolled out around the world because it has many advantages in achieving the best performance without worrying about reliance on charging infrastructure. In addition, the electrification of the powertrain can significantly reduce fuel consumption.

HEVs can be connected in different topologies, depending on the type of hybrid system. These are serial hybrids, parallel hybrids, and power pret hybrids. In the hybrid series, electric motors are the only way to power the wheels. The engine is powered by a battery or alternator. Here, the battery

### *B. Plug-in hybrid electric vehicle*

Plug-in hybrid electric vehicle (PHEV) Includes internal combustion engine and electric motor. This type of vehicle runs on gasoline and has a large rechargeable battery. The advantages of plug-in hybrid electric vehicles are: Reduced oil consumption Plug-in hybrid vehicles use about 30-60% less oil than traditional vehicles. Plug-in hybrids reduce reliance on oil because electricity is primarily produced from domestic sources. Greenhouse Gas Emissions PHEVs typically emit less greenhouse gases than traditional vehicles.

However, emissions also depend on how electricity is generated. For example, nuclear and hydroelectric power plants are cleaner than coal-fired power plants. Charging time Charging with a 120V household outlet can take several hours, while with a 2 0V household or public charger it can take 1- hours. Fast charging with up to 80% capacity only takes 30 minutes. However, it is not necessary to link these vehicles to each other. You can only refuel with gasoline, but you cannot refuel without refueling. achieve maximum range or fuel economy.

### *C. Battery electric vehicle*

Battery-powered electric vehicles, also known as BEVs, are all electric vehicles. It does not have a gasoline engine, but it consists of a large capacity rechargeable battery that can be charged from the outside. Battery-powered electric vehicles use the chemical energy stored in rechargeable batteries to power electric motors and all relevant electronic components inside.

BEVs can not only reduce carbon dioxide emissions from light vehicle fleets, but also reduce their reliance on fossil fuel vehicles (Andwari et al., 2017). BEV holds the largest share of the Indian market, contributing more than 70% of trade in 2017 and is expected to grow over the next few years.

BEVs dominated sales of PHEVs in many countries, but over the past two years, PHEVs have seen rapid growth and sales almost comparable to BEVs. Considering the types of batteries used in the Indian market, they can be classified as lead-acid batteries, nickel-metal hydride batteries and lithium-ion batteries.

In India, Maharashtra recorded the highest sales of electric vehicles in 2017. There is a similar type of document examining comparative strategies for estimating SOC and SOH for hybrid and electric vehicles [15-16] . Error estimates based on Battery Inf Observer in HEV applications are presented by [1 ] and algorithms for determining traction engine temperature and thermal life in commercial HEV are discussed by [8].

Andy et al. , 2010 [17], first naturally and automatically segment road traffic and each demand into cluster hierarchies, then use linear scheduling to optimize by specifying stations on demand . I proposed a model. meet. This work is considered useful for urban planning and fuel infrastructure design in urbanized BEV areas. Cuma and Ko roglu, 2015 [20], conducted a comparative evaluation of different estimation strategies and methodologies used in hybrid and battery electric vehicles. Electric Vehicle Batteries (BEVs) meet two requirements.

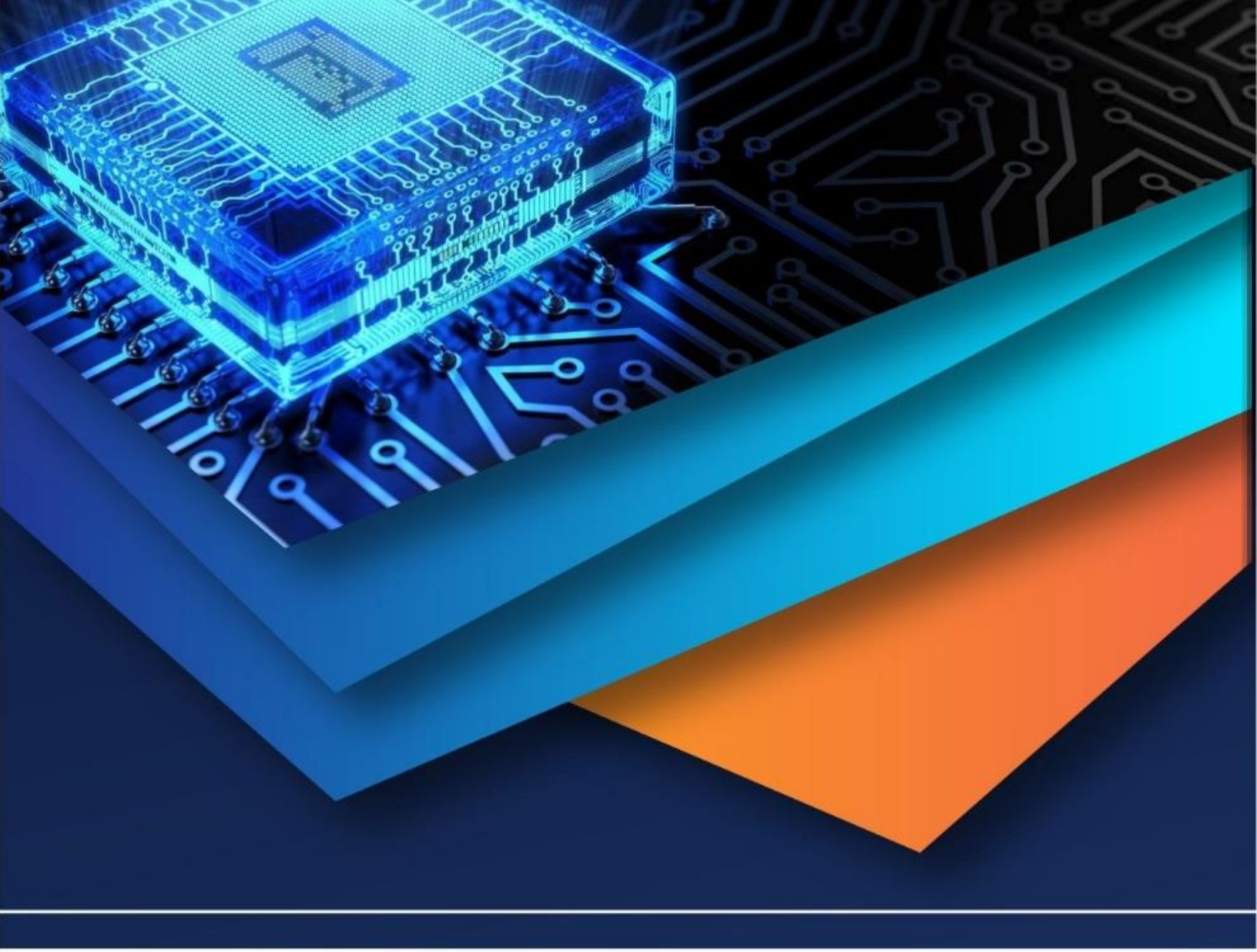
That is, the tertiary electric motor is powered by the replacement battery and the ICEV tank, and the vehicle is connected to the charging port when not in use. Lead Acid Battery Estimation Strategies Traditional methods such as open circuit voltage and amp hours (Ah) are tested on SOC of estimated lead acid batteries using fuzzy logic based algorithms.

©IJRASET: All Rights are Reserved

## III. CONCLUSION

Hybrid, Plug in Hybrid and Electric Vehicles are capable of increas- ing the fuel economy of vehicles but with an increase in the cost of buying compared to traditional vehicles. In general their decreased con- sumption of petroleum and increased productivity offers economic ben- efit to buyers, society, automakers and policymakers over the lifetime. This paper provides a detailed overview of the literature, overview, and guidelines for HEV, PHEV and BEV penetration rate studies into the In- dian Market. The recent initiatives and various subsidies by the Indian Government will help push the e-mobility drive in India. The develop- ment of a new concept of Vehicle-to-Grid can either deliver power to the grid or can be used to charge the battery when non-conventional energy sources are not available. This technology is an important as- pect of energy security, renewable energy, and giving a great scope to deal with global warming issues.

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)