

Current Scenario of Electric Mobility in India and its Challenges

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Abstract—Electric mobility revolution is considered as a biggest revolution for automotive industrial sector. This revolution came into existence due to depletion of crude oil, fossil fuels, natural gas etc. To overcome this crisis many technologies have been developed by different nations in our world. But there is not much awareness about electric mobility among people in India so that they can use this technology. As this technology is new to people living in India there are many difficulties faced by automotive industries to design electric vehicle which will be affordable and suitable for people. Automotive industries of India are trying to improve battery technology by which they can increase range of electric vehicles to make it affordable and efficient. There is lack of charging stations in India moreover average charging time for an electric vehicle is more due to which people are finding it difficult to use electric mobility for their daily usage. A vehicle having less charging time is not affordable to everyone. Government of India is also implementing different policies for electric mobility to reduce pollution and decrease use of fossil fuels made by transportation. Government is also creating awareness among people for using electric vehicle instead of fuel vehicles.

Keywords— Fuel vehicle, regenerative braking system, Internal Combustion Engine(IC engines), battery electric vehicle (BEV), Electric vehicle.

I. INTRODUCTION

Electric vehicles technology came into existence since 1837 in Scotland by Robert Anderson [1]. He made a first electric crude vehicle which works on both electric motor and crude engine [1]. After that many scientist performed different research and invented different electric vehicle. Each vehicle would have more improvement compared to previous electric vehicle. Scientist made improvements in battery technology, electric motor which improved efficiency and speed of vehicle day by day. But after some years internal combustion engines (IC Engines) were introduced in automobile sector due to which speed of vehicle became more than the speed which electric vehicle were giving. So, due to this IC engines technology there was a break to electric mobility technology and scientist started their research on IC engine vehicles. After many years due to excessive use of crude oil, fossil fuels and natural gas by fuel vehicles there was depletion in this fuels sources. This made automobile sector's to introduce electric mobility technology again. Electric vehicles were used in many nations earlier. But in India electric vehicles was introduced in the year 2011 by Mahindra electric mobility Ltd. And Reva electric company car i.e. Revai

electric car [2]. This car was equipped with lead-acid battery which gave range of 80km per charge [2]. Its top speed was 80km/h [2]. After this Mahindra introduced different electric vehicles in India. Electric mobility started getting importance in India but less than expected as people were expecting more improvement from it. Indian scientists are doing research to improve factors that makes electric vehicle compatible for daily usage. The electric vehicle having more efficiency is expensive which cannot be afforded by common people. Also on an average electric vehicle requires minimum 8-9 hours to charge from 20% to 80% moreover range of such electric vehicle is very less which make it incompatible for daily usage. And also in India there is less charging station where people can charge their electric vehicle when they are travelling long distances. Due to these parameters there are fewer sales of electric vehicles in India. Electric vehicle require more charging time and less range due to less improvement in battery technology. First battery introduce for electric vehicle was lithium-ion battery in roadster battery electric vehicle (BEV) [1]. But lithium-ion battery was having less capacity due to which range of electric vehicle were less. After scientist performed different research and made improvement in battery technology. To reduce charging time. Rapid chargers were introduced due to which battery was charged in less time. But in some nations rapid charging is provided only by charging stations of electric vehicles. In India there is less charging station compared to other nation due to which people cannot charge their vehicle for more time and use it daily. Government in India is implementing different policies to make people aware about using electric mobility's. Government has started 'National Electric Mobility Mission' (NEMM) from the year 2020 [3]. In this mission government is going to introduce electric vehicle to people and increase usage of electric vehicle in India [3]. For this government has also introduce 'Faster Adoption and Manufacturing of Hybrid and Electric Vehicle' (FAME) in which they have taken some measures for reducing cost of electric vehicle and increase its sale in India [3]. This will increase awareness about importance of electric vehicle in India.

II. AWARENESS OF ELECTRIC MOBILITY IN INDIA

India is the only country where electric vehicle was introduced late than other countries. Due to which Indian people are not aware about electric mobility technology as this technology is new to people and they didn't have much knowledge about it. Due to which people think instead

