

Energy Sources and Electric Vehicles in INDIA.

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Abstract- Battery powered electric vehicles, need of society were commercially available in the 1890s and available throughout the first decade of 20th century. EV's are popular due to its cleanliness, simplicity of operation and reliability. Gradually performance and reliability of internal combustion (IC) engine is improved and inherent limitations of EV's became obvious to go off-road in the race of sustenance. Major limitation of acceptance of EV's lies in the moderate performance of the battery. Still EV's have continued where pollution and noise at its unacceptable stage. A renaissance of interest in road EV's began in 1970s as a result of oil crises. People realized long term feasibility of internal combustion vehicles NOT possible with limited fossil fuels. Internal Combustion Engine Vehicle (ICEV) had established its supremacy in road transportation, concern over both increasing atmospheric pollution and diminishing petroleum supplies has led to renewed activity in Electric Vehicle (EV) development.

Keywords- ELECTRIC VEHICLE (EV), INTERNAL COMBUSTION (IC), BATTERY ETC.

I. INTRODUCTION

World is facing major crisis of Energy. This is mainly due to environmental imbalances caused by artificial factors like excessive use of fossil fuels. Energy consumption is increasing every year and main resources of Non-renewable energy are petroleum products, particularly petrol and diesel. Most important reasons of energy crisis are limited reserves of fossil fuels, growing environment pollution and unpredictability of crude oil prices. Also vehicular pollution has a serious impact on the environment, which leads to severe health issues and hampers quality of life. Even though development of Internal Combustion (IC) Engine vehicle, is one of the greatest achievements of modern technology caused and continues to cause serious problems for environment and human life. Air pollution, global warming and rapid depletion of the Earth's petroleum resources are now problems of paramount concerns. At present all vehicles rely on the combustion of hydrocarbon fuels to derive energy necessary for their propulsion. Pollution free or zero emission is possible in transportation by electric vehicles, fuel cells and hybrid vehicles. There are six types of vehicle are available for transportation i.e. Bio-Fuel, Flex-Fuel, Battery Electric, Hybrid Electric, Hydrogen gas and Natural gas.

II. HISTORY AND PATH

The first EV was built by Frenchman Gustave Trouve in 1881. It was a tricycle powered by 0.1 hp DC motor fed by Lead-acid batteries. Among the most significant EVs to reach

100km was "La Jamais Contente" built by Frenchman Camille Jenatzy.

Electric Vehicle (EV) uses one or more electric motors or traction motors for propulsion. There are mainly three types of electric vehicles, they are

1. Hybrid Electric Vehicle (HEV)
2. Plug-In Hybrid Electric Vehicle (PHEV)
3. Single fuel all-Electric Vehicle (EV)

Electric powered motor vehicles were first introduced in 19th century. Negligible availability of required infrastructure is a major setback in Electric Vehicles. During 1970's production of EV's resumed because of growing air pollution caused by fossil fuel vehicles. Important stakeholders in EV industries include Consumers, car dealers and garages, fuel or gas or charging stations, charging infrastructure manufacturers, battery manufacturers, automobile industry, finance and insurance companies and government.

At certain levels risk is associated in adaptation of electric vehicles, which include

1. Charging infrastructures or charging station adoption risk.
2. Consumer adoption risk.
3. Utility infrastructure adoption risk
4. Co-innovation risk.

As gasoline automobiles became more powerful, more flexible and above all easier to handle, EV's started to disappear. EV's limited driving range and performance that really impaired them versus their gasoline counterparts. In 1966, General Motors built the Electro-van, which was propelled by induction motors that were fed by inverters built with thyristors. The most significant EV of that era was the Lunar Roving Vehicle, which the Apollo astronauts used on the Moon.

III. ARCHITECTURE OF ELECTRIC VEHICLE SYSTEM

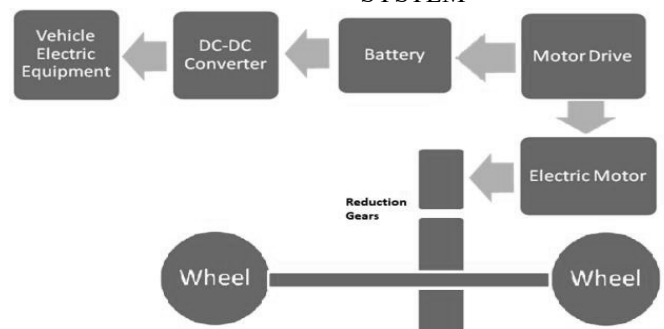


Fig.1: Schematic of electric vehicle.

In EVs, the battery is the original energy source and provides electric power to electric motor drives and other equipments, such as lighting devices. As shown in Fig.01, Control system