

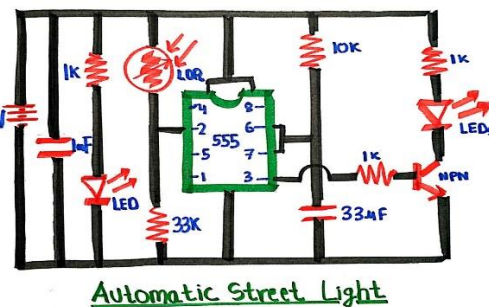
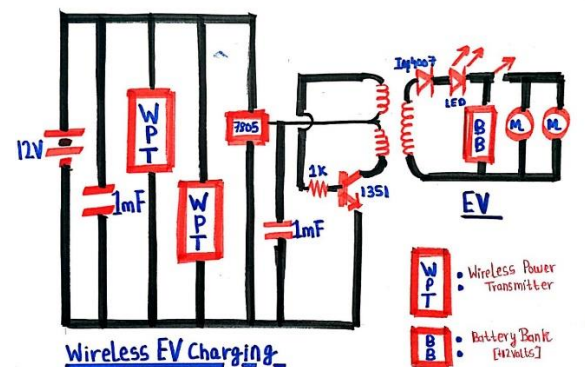


WIRELESS CHARGING OF ELECTRIC VEHICLE IN SMART HIGHWAY

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Abstract-Electric Vehicle charging could be done statically or dynamically. To improve EV and sustain the environment. Dynamic charging method like *wireless charging* are used. The main principle of wireless charging is transmits power with the help of by electromagnetic field between the coils. By using this Inductive power transfer battery are recharged through transformer winding placed at the bottom of car and other placed under the road. This would greatly increase the range of EV making it suitable for long drive & efficient too. This paper specially presents an evaluation on how future EV development and Wireless charging methods can be implemented on smart highway.

Key Words: Wireless Power Transfer [WPT], Wireless Charging of Electric vehicles [WCEV], Wireless Electric Vehicle Charging System [WEVCS].



1 INTRODUCTION

In the current scenario global Warming and climate change, electric vehicle could play a vital role and new charging methods like *wireless charging* could help promote the same. With the help of Wireless charging, the EVs could be charged while driving, so frequently stopping at a station for charging is greatly reduced. This dynamic charging system would complete transform the electric vehicle industry making efficient and most importantly sustainable for environment.

2 FUNDAMENTAL CIRCUIT

3. PRINCIPLE OF OPERATION

The wireless EV charging on smart highway consists of 4 major components that are:

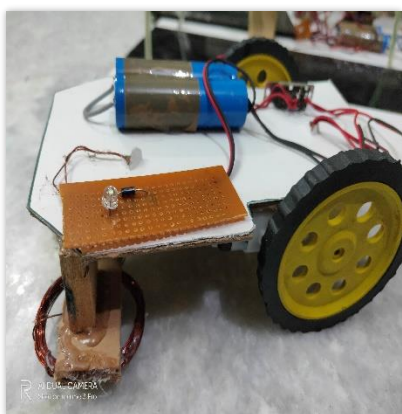
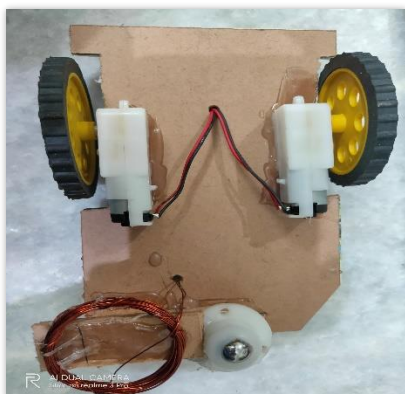
(A) INPUT POWER SUPPLY- Input to the system is obtained from 3 renewable source of energy that are Solar energy, wind energy, Noise energy. All the source are connected in series with rectifier circuit so as to get DC. At There output end to charge the battery bank and also restricts the reverse flow of power. All the source are connected in parallel.

(B)BATTERY BANK- 3Li-on Batteries connected in series having 4V each are connected in parallel to each of our sources, which supplier power to automatic street light modules & wireless Ev charging module.

(C) AUTOMATIC STREET LIGHT MODULE- The core working principle of this module is based on LDR whose resistance varies in different intensities of light. During Night time LDR resistance is high causing switching ON the street

light. During Day time LDR resistance is low and street light are off.

(D) WIRELESS EV CHARGING MODULE- It consists of a pair of high frequency transmitter and high frequency receiver coil. The high frequency transmitter coils are installed on the highway to provide wireless charging and the frequency receiver coil is installed in EV with a battery bank to store the energy transmitted wirelessly to run the vehicle in the absence of charging points.



Dynamic wireless charging vehicle's

4. MERITS AND DEMERITS OF WIRELESS CHARGING SYSTEM

(A) Merits: -

(a) More convenient –
The electric vehicles are easy to Rejuvenate. No need to run gas stations to refuel the car. Even a regular household socket suitable for charging.

(b) Gas Cost –
Since electric vehicles need no fuel or gas to power them, a user Rid of hiked prices of fossil fuels. All it needs is to be plugged in and ready to go another 400 miles.

(c) Environment-Friendly – The substantial reason to use an electric vehicle is that it is environment friendly. They do not release vicious gases that lead to air pollution and sound pollution.

(B) Demerits: -

(a) Lack of Charging Stations – One of the major advantages of using an EV is the fact that it does not need any petrol or diesel to run. Instead, it just needs a charging station where the vehicle can be plugged and ready to go. However, one of the major challenges that are hindering its adoption is the lack of a sufficient number of charging stations. For example, India has very few EV charging stations. Even if you buy an EV, it will make no sense unless there is a charging station in your vicinity. For promoting an increased adoption of these vehicles, it is first necessary to build an adequate number of charging stations.

(b) Expensive – Buying an electric vehicle is still expensive. There are many fossil fuel cars available in the market at different price points. However, electric vehicles offer lesser options to choose from, and the better ones are highly priced. It is absolutely necessary for governments to promote the usage of EVs through subsidies and incentives – both to buyers and manufacturers. Even the batteries that are used are still costly, though their prices are estimated to drop in near future.

(c) Lack of Power and Reduced Range – Fossil fuel-based cars offer better acceleration when compared to electric vehicles. Though Tesla and Volkswagen are making EVs with better range, an average electric car can easily run at 100 miles to 200 miles per charge. Hence people are still sceptical about using electric vehicles for long journeys/ highway drives.

5. CONCLUSION

This paper has outlined a comprehensive overview of wireless charging technology for EVs. This paper has outlined a comprehensive overview of wireless charging technology for EVs. WPT technology offers the possibilities for better energy performance, lower environmental impacts, lower life cycle cost, and more convenience and operational safety benefits. In this project we are focusing on smart charging of EV mainly through wireless mode, and detecting the charging station nearby and for this generating electrical energy by sources like solar, wind and noise vibrations.

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