WIRELESS CHARGING VECHILE USING SOLAR AND WIND ENERGY

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ABSTRACT

Electric vehicles (EVs) are becoming more popular due to concerns about the environment and rising gasoline prices. However, the charging infrastructure is lacking, and most people can only charge their EVs at home if they remember to plug in their cars. Using the principles of magnetic inductance and magnetic resonance, wireless charging (WC) could help significantly with these infrastructure problems by making charging secure and convenient. WC systems also have the potential to provide dynamic charging, making long road trips with EVs feasible and eliminating range anxiety. In this paper, we review the companies available in the literature that have developed electric vehicle wireless charging systems, automobile manufacturers interested in such technology, generate power using solar panel located In roof of the car and the fan that generate its own power then it fixed in side of the car . While the field is still very young, there are many promising technologies available today.

Keywords: *Electric vehicle, Wireless charging, Inductive charging, Magnetic resonance, Wireless power transfer, Solar panel ,fan that generate TEG power*

I.INTRODUCTION

Today's overpopulation requires a plethora of energy sources, often constrained by the utilization of fossil fuels, petroleum ,gas ,coal ,and atomic power. The world has to keep up to 80% of our natural energy resources on the earth in order to keep our global average temperature below 1.5 degree celcious. To overcome the usage of fossil fuels EVWC , Solar and wind energy consumption are used[2].

Electric vehicle wireless charging (EVWC) technology operates on the principles of magnetic inductance and magnetic resonance. Similar to the way a transformer operates, a mag netic field is induced in the surrounding area by running currents through a coil of wire. Exposing another coil nearby to that magnetic field will induce an electric current in the nearby coil; thus, wireless power transfer (WPT) is achieved. However, unless the coils are very close together and aligned correctly, this power transfer method, known as inductive power transfer, typically has a suboptimal efficiency. To increase the WPT efficiency at longer distances between the source and the receiver with poor alignment, magnetic resonance is introduced .This involves "tuning" the source and receiver circuits so that they both magnetically resonate at the same frequency, which greatly improves WPT efficiency. Some research has demonstrated that optimizing shape, arrangement, and number of the turns in the transmission and receiver coils can increase the WPT efficiency .In addition, a number of specialized circuits are required toconvert the AC signal to DC to charge the battery, as well as to regulate the power[5].

The purpose of photovoltaic panel is charging batteries of electric vehicles. It introduces a new charging technique that harnesses the maximum power from the photovoltaic panels and simultaneously shares the energy with the other vehicles and the charging station (or the hub). This ensures that even if the battery of the vehicle is fully charged, the energy generated by its panel is still utilized[6].A solar cell is the heart of solar energy harvesting which converts light into electricity. Basically, a solar cell is a current source made up of PN junction semiconductor material with open circuit voltage varying from 0.5V to 0.8V depending on the material used. A number of solar cells connected in series and the parallel combination make the solar panel. When placed under the sun radiations, solar cells generate the electrical energy and similarly when an electrical energy

is supplied to the solar cell; it acts like a load and gets heated. Hence, when a panel consisting of solar cells connected in series and parallel is used to charge the battery, usually freewheeling diodes are connected to avoid the reverse flow of current from the battery to the solar cells[1].

Wind energy is one of the fastest-growing green technologies as it provides clean,safe,and renewable electricity generation the wind is predominantly used for higher power generation at a minimal cost. The technological rise of wind power in an unprecedented manner has created new opportunities and challenges in the electrical power sector[4]. Rotation of fan generates electricity. Further, wind power based electricity generation of the whole world accounts 4% which is a predominantly higher than other renewable energy resources[7] .

II.OPERATING PRINCIPLE OF THE PROPOSED CONVERTER

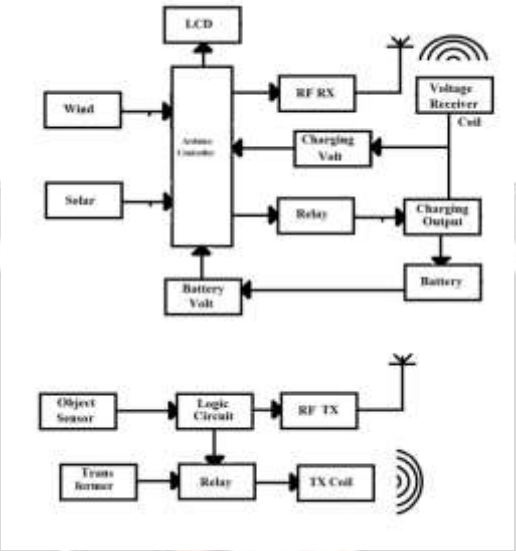

Fig.1. Block Diagram

The source contains TX coils, RF TX, relay, logic circuit, object sensor, transformer. The Object sensor, sense whether the car placed correctly to the charging pad. When the car is placed, intimate the logic circuit to allow current to the relay from the Transformer. The TX coil transmits the signals to the receiving coils.

The receiving coil receives the signal from the RF TX. Voltage Receiver will send voltages through charging output to battery. The total voltage received by the receiver will be noted in the charging voltage and the battery voltage will also been noted in the battery voltage. Charging voltage and the battery voltage connected to the arduino controller. The two coils which is placed in the source and the recipient will generate magnetric flux between them.Wind and Solar power generation connected to arduino controller[2] . The chargers produced by solar and wind are stored to the battery.

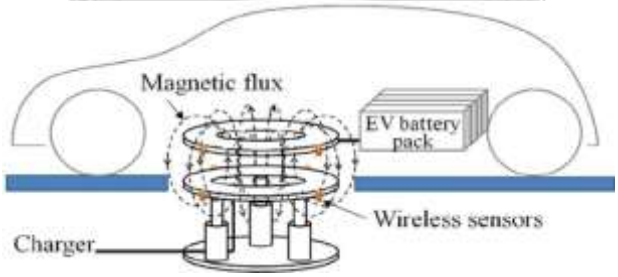

Fig.2.Wireless Electric Power Charging System

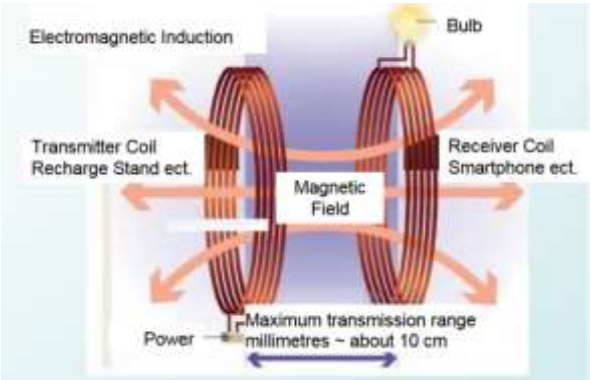

Fig.3.Coils

Their commercialized EVWC technology involves receiver and transmitter charging pads that operate on WPT via strongly coupled magnetic resonances . The transmitting pad attaches to the bottom of the car, and the receiving pad stays on the garage floor.

This system incorporates a transmitting coil, receiving coil. The two resonance coils, in spite of their relatively low coupling factor due to their separation, are tuned to resonate at the same frequency.So that energy can be transferred over a distance. Coupling factor is referred to the magnetic interference between the Transmission (Tx) and Receiving (Rx) coils.

Tuning the two circuits' resonance frequencies and matching their impedances greatly increases efficiency and decreases power losses from the system.Energy transfer can occur between two coils ,through any non-metallic surface, meaning that the floor pad can be installed below a garage floor[5].

Fig.4.Solar Panel

Then Polycrystalline solar panels are used because, making of polycrystalline solar panels are simpler and cost effective. Heat tolerance of polycrystalline solar panels is lower when compared to mono crystalline solar panels. The illustrates the projection view of solar panel. Solar panel placed on top view of the vehicle is 15watt[6] .And wind power can be obtained with the charge in horizontal air movement .wind fans converts wind power into mechanical power which in turn converted into electricity by the generator[1].

Fig.5. Wind Fan

III.PARAMETER DESIGN

A.Coil design:

An air-core wireless transformer design is used in the WPT to enable electrical power flow from the source to the receiver sides. The possible designs of the WPT system, several planar coil shapes such as circular, rectangular, and hybrid configurations that are used to improve the performance and solve the misalignment problems between the transmitter and receiver[5] . The specifications of the models are presented. Also, the corresponding advantages and weaknesses of each model are presented . In the literature, multiple WPT structures for automotive applications are evaluated to assess the magnetic coupling and feasibility .15 windings are in the coil. Both the source and the recipient has the same number of windings[2].

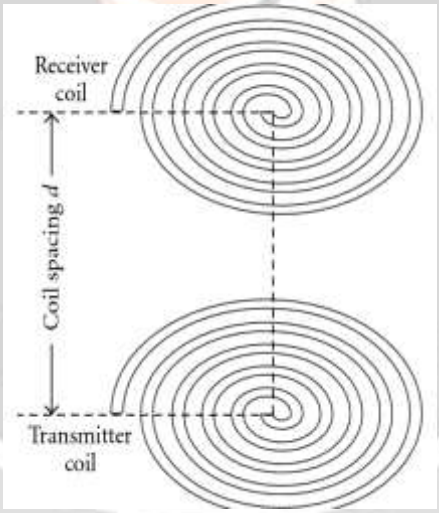

Fig.6.Coil Windings and Distance

B.photovoltic panel:

It is a new architecture for charging electric vehicles using power from photovoltaic panels. Electric vehicles having their own photovoltaic panel on the roof . The charging station or the hub consists of a large battery bank and a large photovoltaic panel. Our project placed with 15watt solar panel. Normally automobile has minimum 50watt solar panel to charge the vehicle. The easy and long use of battery car placed with 500watt photovoltaic panels[1][6].

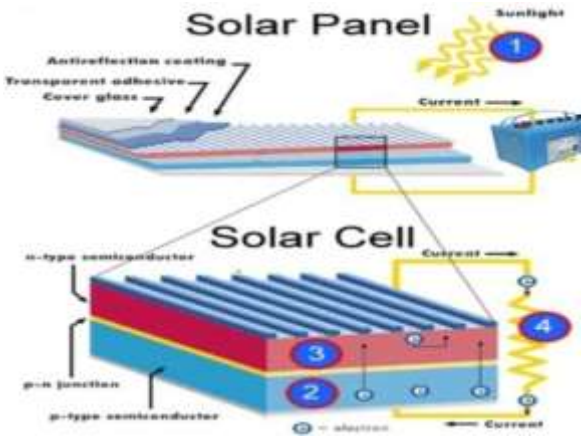

Fig.7.Solar Power Generation Method

Fig.8.Solar Car

C.Wind fans:

A Wind fans transforms wind energy into current using aerodynamic force from the wind-driven rotor blades. As wind flows through the blade the air pressure decreases on one side of the edge the difference in air density between the blade's two sides produces life as well as drag[7]. The lift force is stronger than the heave which causes the rotor to whirl. The rotor is attached with the generator either directly or via a shaft and a series of gears that accelerate the rotation and allow for a physically smaller generator . The conversion of aerodynamic force to rotation of a generator creates electricity[4]**.**

IV.RESULTS AND DISCUSSIONS

Transmitter coil voltage	15v
Receiver coil voltage	12v
Distance between two coil	10cm
Battery type	Li-Ion
battery volts	12v

This paper introduces a new system architecture for charging solar powered and wind powered vehicles.In this project we are using renewable energy solar provide input for a Wireless Power Transfer system. By using solar energy-based charging system we can produced power during the day time and it can be used at night to charge Wind turbine[1][7]. Which is used to avoid the flux leakage and short circuits occurred due to the cables. This will be helpful for those who are doing research in the area of Wireless Power Transmission. The wireless power transmission is used to operate the car with high frequency and improve the quality parameters[2].We are using another renewable energy is Wind energy. Wind energy is the most rapidly growing green industry and will be a primary rich source of renewable power for the globe in the near future. The unlimited wind resources, when utilized at a large scale , will provide technological developments with various innovative opportunities.EVWC technology is growing quickly and moving rward.Charging systems are starting to become commercially available as the EV market slowly grows, and the improved infra-structure is bound to boost the popularity of EVs. Various EV wireless charging techniques reported in the literature are reviewed[2][4][6].

V.CONCLUSION

EV wireless charging systems are classified based on the air-gap length between transmitting and receiving ends. Various EV wireless charging techniques reported in the literature are reviewed. Theprinciple of each technique is introduced, various topologies associated with each technique are summarized and compared with a particular focus on power transfer efficiency[2].For a sustainable electrified transportation system, dynamic wireless charging system should be developed for a greater output power efficiency during misalignments with a reduced installation costnew system architecture for charging solar power electric vehicles. It efficiently charges the batteries of solar powered vehicles with minimal usage of the energy. Wind electricity can be generated using the PMPC motor with 2v maximum high speed[4]. Though Solar power and wind electricity are the way forward for a greener tomorrow[4][6]. Fast charging can be implemented for the future use.

VI.REFERENCES

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