Implementing the Wireless Charging of Electric Car While Running with the Help of Renewable Sources

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Abstract—

This era of innovation and developments in the field of technology us to progress towards better standard of living with good protection of life. people are tired of charging the cars because its takes to muck hours, we got something for them. We will develop wireless charging system for electric car which will charge it while running. We will used here the wireless power transfer mechanism and electronic components for implementing our project. here we can use solar energy wind energy and components for instance transmitter coil, receiver coil, solar panel, wind turbine, etc. In cars we will place our receiver coil and under the roads we can place the transmitter coil as when the car will come in contact with a road while driving then it will detect then and automatically start charging cars and other problem might occur system initiate the command to system which display on car system. As every project has its merits and demerits its merits are people can save more time and continue their journeys without any obstacles.

In this ever-charging world people have advanced in the field of technology as the research progress it gibes boost to other ideas and innovation for smooth function of economy the cost-effective innovation ideas could give little push to our traditional way of using technology now in a modern way for instance flying cars, electro magnetics trains, solar powered or hydrogen powered cars wireless charging cars. As we can see electric cars are flooding market because they own the future makes, we think, there needs more innovation such as wireless charging of cars in running condition.

Keyword - hybrid generation

I. Introduction.

Vertical windmill which generates power on highways satisfies cost and efficiency which is less. Vertical windmill is eco-friendly and also cheaper when compared with power generation using conventional method. Here there are two energy well organized renewable energy for power production start. In this design there are two entities, one for electric vehicle charging and another is streetlight control using LDR and IR sensors. In the absence any one of the energy sources, the other sources will be consumed as additive. Not only that, this method is highly economical, butalso highly efficient. The design of this rotor turbine is in such a way that it rotates when the vehicle moves in both the lanes of road. This is also one of the most efficient ways of power generation on the highway roads. Every year electric cars become more affordable which leads investors to start investing in charging stations due to the growing demand for them. At present, power grids are more dependent on fossil fuels than on renewable energy. Although EVs are powered by electricity, they will also contribute to harmful emissions as power generation at the charging stations should also be considered which will be an additional production from mineral oil. Therefore, in order to minimize the impact of harmful emissions, renewable energy, especially solar powered charging stations, can be built. This paper provides the best DC connector solution for pv-wind system. Two separate batteries will be used in such a way that any power measuring batteries can be used in the solar and wind systems. And solar and wind systems can be built on any number of different energies.

In this microcontroller is used to periodically check the strength of batteries. A constant voltage can be maintained in both pv and air using a boost converter and used to charge the battery. Electric cars will dominate the world in the future, because that charging station is located on the roads. Therefore, during peak hours an increase in the number of charging station will draw additional power. The main idea of this project is to prevent the loss of power factor due to charging stations at very high hours. In this the algorithm is used to test the batteries of the solar and wind systems. Only when both of these batteries are discharged will the power from the main source be removed. Fig. 1: On-board and off-board of EV chargers. Fast charging as an in-house EV board is hampered by the cost of the electronic components required for power conversion, which increases the total cost of EV.

However, in-board chargers cannot provide fast EV charging due to the high cost of EV-related electronics and the need to increase the charger capacity of the car. To ensure faster EV charging, off-board chargers that provide high DC power are used. It is noteworthy that, for off-board chargers, all AC / DC power conversion is done with an independent inverter. Therefore, it is important to increase the power of the converters to ensure faster car charging. The findings of several published studies have been used on EV charging stations to design and develop efficient and reliable EV charging systems

II. Objective –

In older time the vehicle is run fuels like diesel, petrol, kerosine but the time passes due pollution the people think that the car making more carbon emission therefore they think that make new logical think that will reduce the emission therefore they invented the electric cars but in that car the problem is that time required for battery is more and the someone speed up the vehicle then is effect on battery is fastly draining and in case of emergency people want to go far away urgently that condition it's not working. Therefore, we invented this project implementing the wireless charging of electric car while running with the help of renewable source

The objective of dynamically charging an electric car, also known as dynamic wireless charging, is to provide a continuous supply of energy to the vehicle's battery as it travels on the road, without requiring the driver to stop and plug in the vehicle. This technology has the potential to eliminate the range anxiety associated with electric vehicles, as it allows for extended driving ranges without the need for long charging stops.

Dynamic wireless charging involves installing a network of charging coils under the road surface, which generate an electromagnetic field that can be picked up by a receiver coilon the underside of the electric car. This allows for the continuous transfer of energy to the vehicle's battery while itis in motion, similar to how a smartphone can be charged wirelessly on a charging pad.

In addition to increasing the convenience and range of electric vehicles, dynamic wireless charging can also reduce the need for large battery packs, which can be heavy and expensive. This could lead to more efficient and cost- effective electric vehicle designs, making them more accessible to a wider range of consumers.

III. Purpose –

The purpose of dynamically charging an electric car, also known as dynamic wireless charging, is to provide a continuous supply of power to the vehicle's battery as it moves on the road. This technology eliminates the need for electric vehicles to stop and plug in for recharging, thereby increasing their driving range and reducing "range anxiety" among EV drivers.

Dynamically charging electric cars involves embedding a network of charging coils under the road surface, which generate an electromagnetic field that can be picked up by a receiver coil on the underside of the electric car. This allowsfor the continuous transfer of energy to the vehicle's battery while it is in motion, allowing the car to travel indefinitely without requiring a long charging stop.

In addition to increasing the convenience and range of electric vehicles, dynamic wireless charging can also reduce the need for large battery packs, which can be heavy and expensive. This could lead to more efficient and cost- effective electric vehicle designs, making them more accessible to a wider range of consumers.

Due to this project the large amount of employment will be generate. And the greater level of electricity will be generated due to this supply of need to is come

IV. Problem statement-

One problem associated with dynamically charging electric cars, also known as dynamic wireless charging, is the cost and complexity of implementing the technology. The installation of a network of charging coils under the road surface can be expensive and time-consuming, and retrofitting existing roadways with this technology may not be feasible.

Another challenge is the standardization of dynamic wireless charging technology. There are currently no industry standards for this technology, which could lead to compatibility issues and hinder widespread adoption.

Moreover, the efficiency of dynamic wireless charging is another issue. Some studies have shown that dynamic wireless charging systems may be less efficient than traditional plug-in charging methods, which could result in higher energy costs and increased emissions from power generation.

Finally, the safety of dynamic wireless charging technology is a concern, particularly with regards to electromagnetic radiation exposure. While there is currently no evidence to suggest that dynamic wireless charging poses a health risk, further research and regulatory guidelines may be needed to address this potential issue.

Addressing these problems will be critical in ensuring the widespread adoption of dynamic wireless charging technology for electric vehicles.

V. Literature Survey –

Various configurations of hybrid solar wind systems have been introduced [1]. The Standalone hybrid pv-wind system was introduced [2]. Horizontal axis turbine models with PV of the same members as well as their MPPT power tracking controls and flexible power controls and control control are provided [1] Some charging station concepts are discussed. In particular there are four charging methods and they are discussed in. Other hybrid techniques are discussed in. Recently, both the development of battery technology and the electric powertrain accelerated deep marketing and strong policy support. Battery production costs have dropped dramatically over the past three years. EVs in the futures car market will likely play a major role. Under the circumstances of the EV transformation and as a result of the persistence of the proposed release program in 2015, statistics show that the number of EVs exceeded one million by October 2018. In fact, the US government has introduced a number of policies to encourage the public sector to suspend EV charging infrastructure. In addition, the Canadian Department of Transportation reported that the State of Ontario invested $ 20 million in 2017 to build approximately 500 EV charging stations in approximately 250 locations. In addition, the German National Platform for Electric Mobility stated that by 2020, the number of EVs will reach nearly one million, and the need will exceed 70,000 stations, especially road charging stations (CPs). In order to overcome the restrictions on the use of RES and to meet the growing demand for EV power, China developed a model to specify a given number of charging stations with solar-based charging systems.

In May 2017, a team of 10 countries (China, Germany, Sweden, the Netherlands, Norway, Japan, France, the United Kingdom, Canada, and the United States) organized intergovernmental meetings on EVs (EV Initiative) programs to promote global development. Car manufacturers in several countries recently tried to satisfy the needs of customers by introducing novel EV models, such as a plug-in hybrid electric car (PHEV) and a less expensive battery-powered car (BEV) than ICEVs. In addition, both active and competent companies were collaborating with stakeholders to develop and expand the EV charging market. Despite the importance of the changes and laws mentioned above, these countries do not have adequate and stable EV charging infrastructure

VI. Construction –

Dynamically charging an electric vehicle involves the use of an infrastructure that allows the vehicle to charge its battery while it is in motion. There are different construction methods that can be used to achieve this, but the most common one is the use of conductive or inductive charging systems embedded in the road.
The construction process involves several steps, which may include:

1. Here we first placing the wireless power transferred mechanism, the primary coil is placing under the roads and the secondary coils is placing it the car will get supply through the primary coil
2. Then now next between the middle of road in the divider we are placing the vertical axis wind turbine of 12v, and at the top of the street light we are placing the solar panel 12v, and then adding both power and making it to hybrid power due to help of the rectifier and convert it into the AC power and then we giving that power to the base station.

Vertical axis – here we making vertical axis wind turbine and placing it in dividers
Solar panel – placing it to the top of the street light.
Road Preparation: The road where the charging system will be installed needs to be prepared by removing any existing asphalt and creating a shallow trench where the charging system will be installed.
Installation of Charging System: The charging system is then installed in the trench. There are two types of charging systems that can be used: conductive and inductive.
Conductive charging system: This system uses a conductive plate that is embedded in the road surface. When an electric vehicle drives over the plate, a conductive contact is made, and the battery is charged via a cable that is attached to the plate.
Inductive charging system: This system uses a series of coils that are embedded in the road surface. When an electric vehicle drives over the coils, an electromagnetic field is created, which induces a current in a coil in the vehicle. This current is then used to charge the battery.
Connection to Power Grid: The charging system needs to be connected to the power grid to provide electricity for charging the vehicle. This may involve installing a transformer and other electrical equipment.
Testing and Calibration: Once the charging system is installed, it needs to be tested and calibrated to ensure that it is working properly and providing the correct amount of power to charge the vehicle's battery.
Maintenance: The charging system requires regular maintenance, including cleaning and inspection to ensure that it is working properly and is safe for use by electric vehicles.The construction of a dynamically charging system requires careful planning, installation, and maintenance to ensure that it provides reliable and safe charging for electric vehicles while they are in motion.

VII. Working –

This project is based on the faradays law of electromagnetic induction, here our electric car will charge at time of the running how that we are seeing now

1. Here we first placing the wireless power transferred mechanism, the primary coil is placing under the roads and the secondary coils is placing it the car will get supply through the primary coil
2. Then now next between the middle of road in the divider we are placing the vertical axis wind turbine of 12v, and at the top of the street light we are placing the solar panel 12v, and then adding both power and making it to hybrid power due to help of the rectifier and convert it into the AC power and then we giving that power to the base station.
3. from base station we are giving that power to the primary coil and rest of the power to the grid or other consumer.
4. car will receiver that power through the secondary coil and convert it into the DC using the converter and futher it gets to the battery of car
5. the rest of the power will provide any consumer it will provide through the base station.
6. when car stop on toll station of road he also pay the tariff of the charge which will also include in it.

VIII. Advantages –

Dynamic charging of electric cars has several advantages, including:

1. Extended driving range: Dynamic charging allows electric cars to be charged on-the-go, which extends their driving range. This means that electric cars can travel longer distanceswithout needing to stop and recharge.
2. Convenience: Dynamic charging eliminatesthe need for drivers to stop and recharge theircars, which is more convenient and saves time. 3.Reduced battery size: Dynamic charging canreduce the size of the battery needed in electric cars, which can lower the cost of the car and reduce its weight, leading to better performanceand efficiency.
4. Reduced range anxiety: Dynamic chargingcan reduce range anxiety for electric car drivers by providing them with more opportunities to charge their cars on-the-go.
5. Lower infrastructure costs: Dynamic charging infrastructure can be less expensive than traditional charging infrastructure because it requires fewer charging stations and less energy storage capacity.
6. Reduced carbon footprint: Dynamic charging can use renewable energy sources, such as wind and solar power, to charge electric cars, which can reduce their carbon footprint and help combat climate change.
7. Due this project greater employment willgenerate may people gets a jobs
8. this project use in emergency cases likeuncharged batteries
9. this project contribute to the renewablessources

IX. Disadvantages –

While dynamically charging electric cars has several advantages, there are also some potential disadvantages, including:

1. High infrastructure costs: Building a dynamic charging infrastructure requires significant investment in new technologies and infrastructure, including high-power charging systems, wireless power transfer technologies, and vehicle-to-grid communication systems.
2. Technical challenges: Dynamic charging systems require a

high degree of technical complexity to ensure safe and reliable operation. This includes the ability to maintain contact between the charging equipment and the vehicle while in motion, and to manage the power transfer process to avoid damage to the vehicle's battery or electrical systems.

3. Limited compatibility: Dynamic charging systems may not be compatible with all types of electric vehicles, and some older vehicles may need to be retrofitted with additional equipmentin order to use the technology.

4. Potential safety risks: Dynamic charging systems involve the transfer of high levels of electrical power, which can present a safety riskif not properly managed. There is also a risk of electrical interference with other systems and devices, which could cause accidents or malfunctions.

5. Potential for increased energy consumption: While dynamic charging can extend the range of electric vehicles, it can also result in higher energy consumption due to the additional power needed to charge the vehicle while in motion.

X. Acknowledgment-

It gives us immense pleasure in bringing out the projectentitled
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A frequency reconfigurable MRCWPT system with enhanced efficiency by using the frequency reconfigurable metamaterial is presented in this paper. Frequency reconfigurable mechanism of the system with the frequency reconfigurable metamaterial is derived by the equivalent circuit theory. Finite element simulation results have shown that the frequency reconfigurable electromagnetic metamaterial can manipulate the direction of the electromagnetic field of the system due to its abnormal effective permeability. The location optimization of the frequency reconfigurable metamaterial shows that the optimized distance between the transmitter and the metamaterial is 10 mm. Further measurement which verifies the simulation by reasonable agreement is carried out. PTE of the system by adding the frequency reconfigurable metamaterial are 59%, 73%, 67%, 66%, 65%, 60% and 58% at different working frequencies of 14.1 MHz, 15 MHz, 16.2 MHz, 17.5 MHz, 19.3 MHz, 21.7 MHz and 25 MHz, respectively. PTE of the system with and without the metamaterial is 72% and 49% at the distance of 120 mm and the frequency of 15 MHz, respectively. PTE is improved obviously at the different frequency and the different transmission distance by using the frequency reconfigurable metamaterial.

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