CONTENTS

1.Introduction

This invention mainly focuses on utilizing the renewable energy sources to charge the electric vehicles along with wireless facility, as we all know how the usage of non-renewable sources are effecting the atmosphere and causing global warming as well as we know how much air required to generate wind energy and how much land required for solar energy generation. And every location is not suitable for wind energy generation because of wind flow deviations to solve this problem and also to totally depend on this source, to reduce the charging time required to charge EV's we came up with an effective invention.

As the dividers of the NH's, SH's or Express ways are always free so our invention is that we place a dynamogenerators to which we attached a wind turbine and it has the vertically molded blades.

So whenever the vehicles moves on both sides of the road they generate a wind which flows towards the dividers of the road , as we placed the wind turbines on dividers this air will rotate the turbines and it will generate power .So from here we transfer this power to the a mini grid station where power operations will takes place like step up, step down and filtration and power factor correction etc., from this grid we will provide the power the primary coils placed in the pavement of the road. As the vehicles moves on the road and placing secondary coil at the bottom of the vehicle, it will mutually induce the power in it and charges the vehicle batteries.

2.Components

- 12 volts dynamo motors
- 12 volts battery management system
- 12 volts battery system
- Inverter with filters
- 9-0-9 step up transformer
- Copper coils
- Wind turbines
- 16*2 lcd display
- Node MCU Esp8266
- I2C module
- level shifter from 12 volts to 3.3 volts for batter charging monitoring
- power generated is 11.98+/- 0.2 volts and 20 to 25 milli amps current it gives out power of 2.4 to 2.8 watts power dc for a constant rotation of wind turbines at 600 rpm

3.Current Challenges in Electric Vehicle ChargingWireless Charging Technology

- **Infrastructure Development**: The need for widespread charging infrastructure remains a challenge, particularly in rural and remote areas.
- **Charging Speed**: Current charging speeds are slower compared to refueling conventional vehicles, hindering mass adoption.
- **Grid Integration**: Integrating large numbers of EVs into the grid requires careful planning to avoid overloading local electricity networks.
- **Standardization**: Lack of standardization in charging connectors and protocols complicates interoperability and slows down market growth.
- **Range Anxiety**: Concerns about running out of charge before reaching the destination persist, impacting consumer confidence.
- **Cost**: High upfront costs of installing charging stations and purchasing EVs deter some consumers from transitioning to electric transportation.

4.Renewable Energy Sources for EV Charging

- Solar Power: Photovoltaic panels can be installed along roadways or on structures like overhead canopies to capture sunlight and convert it into electricity for EV charging.
- Wind Power: Wind turbines placed strategically alongside roads or in open areas can harness wind energy to generate electricity, which can then be used for EV charging stations.
- Hydropower: Utilizing flowing water from rivers or streams near roadways through small-scale hydropower systems can generate electricity for charging EVs.
- Biomass: Organic materials such as agricultural residues, wood chips, or dedicated energy crops can be processed into biofuels or used directly in biomass power plants to generate electricity for EV charging.
- Geothermal Energy: Underground heat can be tapped into through geothermal power plants to produce electricity, providing a continuous and reliable source of energy for EV charging infrastructure.

5. Implementation of Wireless Charging on Roads

This groundbreaking solution addresses the critical issues of renewable energy utilization and electric vehicle (EV) charging by harnessing wind power and wireless technology. Traditional energy sources have contributed to environmental degradation and global warming. However, wind energy's effectiveness varies due to location constraints, and solar energy requires significant land usage. To overcome these obstacles and accelerate EV charging, we propose a pioneering method.

Our innovation utilizes the unused space of road dividers on highways, state highways, or expressways. By integrating wind turbines equipped with dynamo generators and vertically modeled blades into these dividers, we harness the wind energy generated by passing vehicles. As vehicles travel along both sides of the road, they create airflow directed towards the dividers, driving the wind turbines and generating power.

The generated power is then transmitted to a strategically located mini-grid station. Here, essential power operations such as step-up, step-down, filtration, and power factor correction are performed to ensure optimal power quality. Subsequently, the power is transferred to primary coils embedded in the pavement of the road.

At the same time, vehicles are equipped with secondary coils positioned underneath. As vehicles move along the road, the secondary coils induce power from the primary coils the road surface. This induced power wirelessly charges the vehicles' batteries, offering a seamless and efficient charging experience.

By leveraging existing infrastructure and renewable energy sources, our invention provides a sustainable solution to the urgent challenges of energy generation and EV charging. It minimizes environmental impact, reduces reliance on non-renewable energy sources, and enhances the efficiency and accessibility of EV charging infrastructure. This innovative approach represents a significant advancement towards achieving a greener and more sustainable transportation ecosystem.

6. Block Diagram & HARDWARE :

In this block diagram, energy generated is utilized for wireless charging of electric vehicles through the roads. Wind energy is converted into electrical energy by wind turbines, which are connected to the grid system. In the grid system, conversion processes occur, and the generated power is distributed to transmission coils placed on the road and to the distribution system. Receiving coils, located at the bottom of electric vehicles, facilitate the charging process. Through cloud software, monitoring of the electric vehicle charging is enabled.

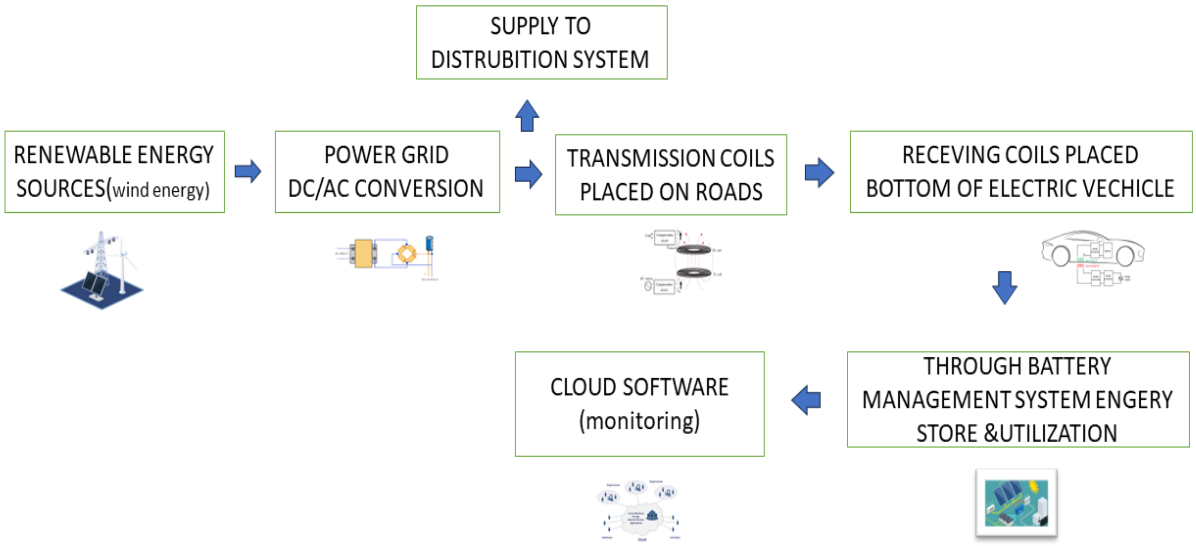

Figure1 Block Diagram shows the wireless charging of electric vehicle by using renewable energy sources

It illustrates the placement of turbines within the median divider island and their connection to the power grid. AC/DC conversion occurs through step-up transformers, with coils connected via electromagnetic induction to transmit energy using air as the core. Consequently, electric vehicle batteries are charged

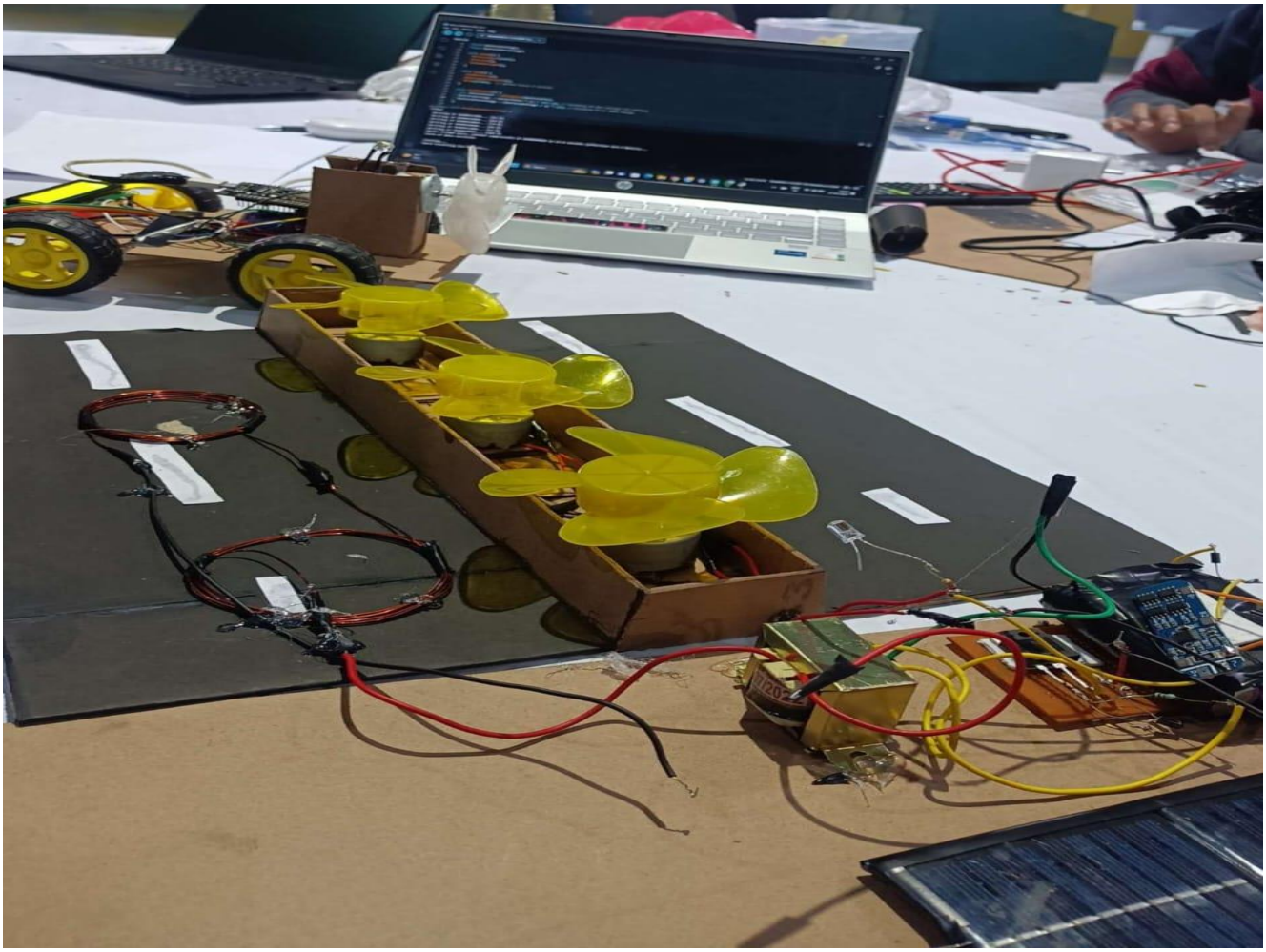

Figure 2 Hardware of wireless charging of electric vehicle

7.Advantages of Renewable Energy for EV Charging

- **Utilization of Renewable Energy**: By harnessing renewable energy sources such as wind, the invention reduces reliance on non-renewable sources, thereby mitigating environmental impact and addressing concerns related to global warming.
- **Efficient Use of Infrastructure**: Leveraging existing infrastructure like road dividers for wind turbines maximizes resource utilization and minimizes additional land requirements, enhancing efficiency.
- **Location Flexibility**: Unlike traditional renewable energy installations that may be limited by location suitability, the invention's placement on road dividers allows for flexible deployment in various geographic settings.
- **Reduced Charging Time**: The integration of wind turbines with wireless charging technology reduces the time required to charge electric vehicles, enhancing convenience and usability.
- **Cost-effectiveness**: Utilizing existing road infrastructure for power generation and wireless charging reduces the need for extensive new investments, making the solution cost-effective in comparison to building dedicated charging stations or power plants.
- **Continuous Power Generation**: The movement of vehicles along the road continuously generates wind energy, ensuring a steady supply of power for charging electric vehicles, unlike intermittent renewable energy sources like solar.

- **Scalability**: The invention can be scaled up or down depending on the demand for charging infrastructure, making it suitable for deployment in various urban and rural settings.
- **Minimal Environmental Impact**: Integrating wind turbines into road dividers has minimal environmental impact compared practices.to large-scale renewable energy installations, preserving natural landscapes and ecosystems.
- **Enhanced Energy Security**: Diversifying the sources of energy generation with renewable sources enhances energy security and resilience against supply disruptions.
- **Promotion of Sustainable Transportation**: By facilitating the adoption of electric vehicles through efficient and accessible charging infrastructure, the invention contributes to reducing greenhouse gas emissions and promoting sustainable transportation

8.POTENTIAL CLAIMS

- Installing dynamo generators equipped with vertically moulded wind turbines along dividers of NH's, SH's, or Express ways.
- Harnessing wind energy generated by passing vehicles to rotate turbines and generate power.
- Transferring generated power to a mini grid station for necessary operations including step-up, step-down, filtration, and power factor correction.
- Transmitting power wirelessly from the grid to primary coils embedded in the pavement of the road.
- Inducing power in secondary coils mounted on the bottom of electric vehicles, thereby charging vehicle batteries while in motion.

9. Conclusion

This innovative solution revolutionizes electric vehicle charging by integrating renewable energy and wireless technology into road infrastructure. By harnessing wind energy from passing vehicles, it offers efficient, on-the-go charging without the need for traditional charging stations. This approach addresses environmental concerns, reduces reliance on non-renewable energy, and enhances the accessibility and sustainability of electric transportation. With minimal environmental impact and cost-effective implementation, it represents a significant step towards a greener and more sustainable future in transportation.

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