



SMART EV CHARGING STATION ON GRID GREEN POWER & WIRELESS CHARGING

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ABSTRACT :

The “Smart EV Charging Station on Grid Green Power & Wireless Charging” is an innovative solution to reduce the pollution. But the Primary reason the people do not prefer E-Vehicle that is a unavailability of the charging station. Increasing in pollution and depletion of fossil fuels (petroleum, diesel, coal, etc.) has paved way of the entry of EV’s in the market. EV’s in the market, But charging the E-Vehicle through the Non-renewable source is not suitable for nature. In our country the vehicle can do pollution so due to avoid this pollution E-vehicle are used. But the there is no charging station available in our country (fast charging station, types of charging station which cannot be based on the renewable energy sources). MSEDCL can provide electricity in our home it can be a non – renewable source (petroleum, diesel, coal, etc.) and it can produce the pollution.

This project is focused on the development of the Charging of the E- Vehicle through the different types of charging (DC charging, AC charging, Wireless charging, for backup the Grid charging). It include the renewable energy sources such as solar and wind, into this EV Charging Station on grid Green Power & Wireless Charging. Addition feature is the Wireless technology that can remove or eliminate the physical connection and enhance the efficiency of E-Vehicle Owners. Additionally features RFID module can install to the E-Vehicle for access control, payment system and gives to permission to the charging.

In this we can charge the E-Vehicle by 4 methods DC charging, Ac charging, Wireless charging and for emergency purpose the Grid charging. This can helps to reduce the pollution of the environment by not using of the now days of petrol or diesel Vehicles. The abstract is the objectives and functions of grid stations on electricity distribution, it discusses the voltage regulation, load balancing and fault tolerance, significance of reliable and stable supply.

INTRODUCTION:

The introduction of the “Smart EV Charging Station on Grid Green Power & Wireless Charging” a new bridge between the E-Vehicle and Petrol and diesel Vehicle and modern electrical engineering innovations. In that a two solar panel installed having an (20 watt each) and two wind plant installed having (10 watt each) generates. The E-Vehicle is charged by 12 V battery, which can charge the E-Vehicle by 4 types.

Key component of the “Smart EV Charging Station on Grid Green Power & Wireless Charging” is RFID module which can give the permission to the customer for charging his Vehicle. The Solar panel and wind plant is supported by robust frame. The solar and wind can continue generates the power to the charge the E-Vehicle. While performing minimizing the reduced in carbon emission, E-waste management and non-renewable energy source.

Wireless charging is the technology that has revolutionized the electronic devices and electric vehicles are powered. It discusses about the principle of electromagnetic induction and resonance used in wireless charging systems. Wireless charging, is a technology that enables the transfer to electrical energy between a power source and an electronic devices without the need for physical connection or cables. It relies on electromagnetic fields to transmit power, making it convenient and cordless way to charge various devices, such as electric vehicles and smartphones even the medical implants.

A Grid station is also known as a Substation which is crucial components of an electrical distribution system. It transform high voltage from the power plants into lower voltage value. Grid stations also help regulate and control the flow of electricity within the Network. The grid station is also known as a substation. The abstract is the fundamental objectives and functions of grid stations on electricity distribution. It discusses the voltage regulation, load balancing and fault tolerance, significance of reliable and stable supply.

PROBLEM STATEMENT :

➤ **Green Power Integration:**

In corporate renewable energy sources, such as solar and wind power to supply the grid electricity and reduce the carbon footprint.

➤ **Inefficient Use of Resources:**

Design charging system that minimize the power losses during charging process, considering the efficiency and standby power peak demand and management and power consumption. Efficient utilization of the space the maximum number or maximum number of charging points ensure the easy and simple access to the users.

➤ **Wireless Charging Technology:**

Current wireless device charging solutions suffer from efficiency losses during power transfer, resulting in slower charging times and high energy consumption.

➤ **Compatibility Issues:**

Due various charging points the EV owner can discourage for various charging plug and charging speed.

➤ **Environmental Impact:**

Burning of a fossil fuels release greenhouse gases can contribute in global warming and change in weather but the electricity generated by solar and wind depended upon the Condition of Nature.

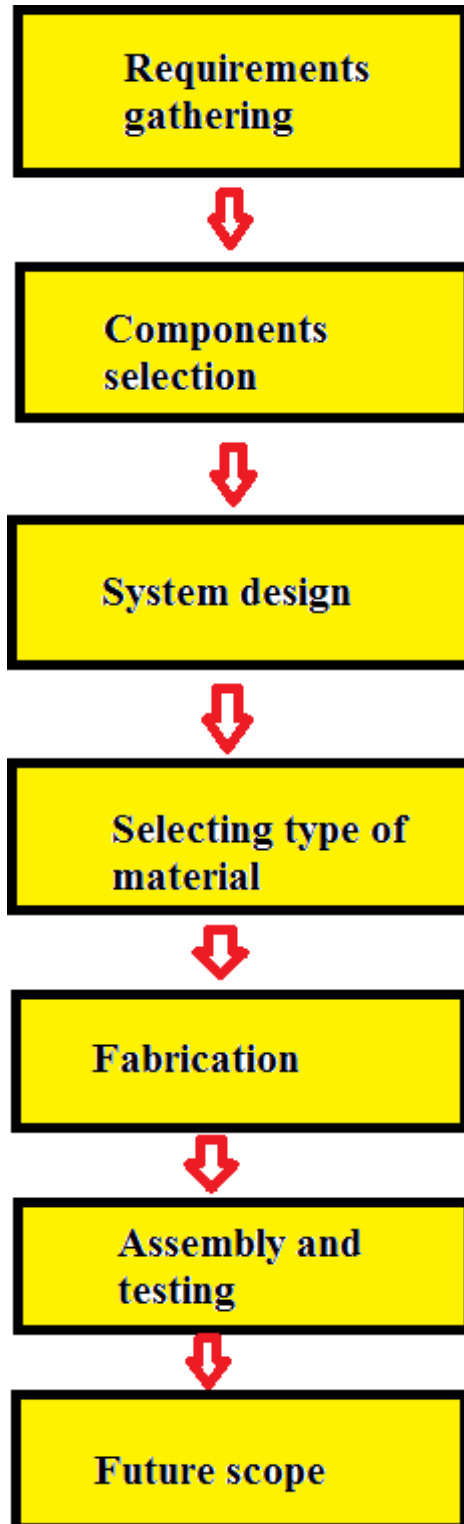
LETRATURE REVIEW :

In this project studied the wireless charging of the E-Vehicle. E-Vehicle charging used in now days of the 21th century is necessary. To provide fast charging in the E-Vehicle we can make the fast charging innovation, so we can provide the 4 types of charging (Grid charging, AC charging, DC charging and Wireless charging). For the Solar plant provide a metallic support and for a wind plant a metallic tower and support with the welded angles. The power generated form solar goes through the wind plant to run use so that is not possible we can connect diode to the wind plant.

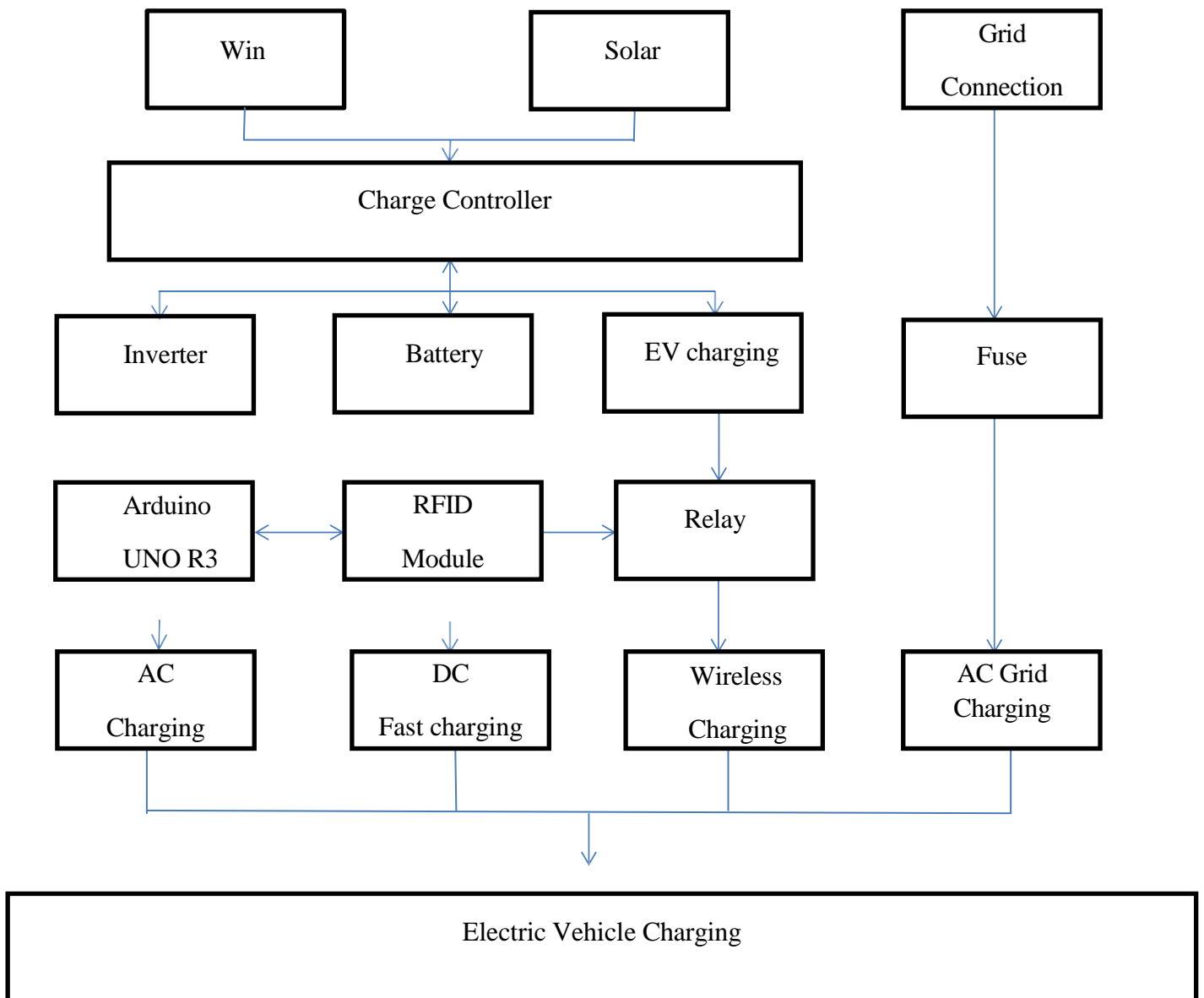
Due to various types of a charging and RFID module the automatic permission is given to the customer for charge the E-Vehicle. Using of RFID module a unique that is it can reduce the time of customer to take a permission from the owner the charging station and charge the E-Vehicle and at this time the vehicle is almost charged so it reduce the time. Due this an output and efficiency of the project. In this paper researcher studies the types of charging methods and technology which can reduce the time, reduce pollution of the Earth. To solve the charging related E-Vehicle we can make this project.

This paper discusses about the charging the E-Vehicle in that has been used to till one or more of the industry or manufacturing companies. With this new technology, the vehicle can get fast charged. After preliminary study, it was found out that power tiller could be adopted for weeding. As a result, the study sought to improve its performance by altering some essential components and technologies such as RFID Module and Wireless technology.

PROPOSED METHODOLOGY & OPERATING PRINCIPLE:



BLOCK DIAGRAM



WORKING PRINCIPLE :

The Smart EV Charging Station on Grid Green Power and Wireless Charging operates on various principles. In this the electricity is generated in solar plant and wind plant is given to the battery through the Invertor. Battery can store the generated electricity in solar and Wind. Battery connected to the charge controller and Charge controller play a crucial role that is system by regulating the flow energy. From charge controller the AC charging is provided to charge the E-Vehicle. The DC charging is provided from the Battery and the wireless charging is provided to the charging the E-Vehicle. Additional Grid charging is provided when the electricity is not generated through the solar plant and wind plant.

As the Vehicle comes at AC charging point it can charge itself by using connecting the pin. After that it comes at DC charging point it can also charge the Vehicle with the pin. But it comes at wireless charging point where Arduino and RFID module can installed. Here there is not visual/wired connection between the E-Vehicle and Charging point. So the permission granted vehicles are charged at the wireless charging point. Here the E-Vehicle owner which has not a REID card the RFID declined it which can show on display. The RFID card is given to customer who is a regular customer of the station and charge the vehicle Daily. With the help of Arduino we can set a limit of time to charge the E-Vehicle. Hence the electricity is not generated through the Solar and Wind then we can use the Grid Charging to charge the E-Vehicle for Emergency purpose. For number and many types of charging is provided at a station which can not disappoint the customer

Overall the Charging the E-Vehicle through the Non-renewable source does not make any sense because we moving towards a Electric mobility. Due to use of E-Vehicle there is no pollution produced in the Nature.

Fabricating the E-Vehicle according to the following step

- The critical study of various research paper
- Gather all the information about the project
- Collect all the components
- Fabricate the all types of renewable energy sources
- Presenting the report and research paper

The EV charging station and wireless charging is designed for charge the vehicle without producing a pollution. The adoption of EV charging station a long distance is not covered at one attempt so that necessary point we have to install the Charging station.

1. Solar and Wind Plant.
2. Invertor & Charge Controller.
3. Battery.
4. Arduino & RFID Module.
5. Frame support for Solar and Wind plant.
6. Relays and some electronic and electrical components.

Working diagram and performance of machine



- Solar Panel -20 watt each.
- Wind Plant – 10 watt each.
- Invertor Kit.
- Charge Controller.
- LCD display 16x2.
- Relay and Control Circuits.
- Arduino and RFID Module.
- Battery (lead acid) – 12 volt each.
- Metal support for solar and wind.

4 types of charging -

1. AC charging
2. DC charging
3. Wireless charging
4. Grid charging.

CONCLUSION :

Increasing pollution and rapid depletion of fossil fuels has paved a way to the entry of EV's in the market. But charging of E-Vehicle through conventional/Non renewable energy sources will can make the pollution. The development of the E-Vehicle represents a significant advancement in E-Vehicle is a new bridge between the E-Vehicle and Petrol and diesel Vehicles. The capable of fast charging with the help of Solar and Wind plant must adopted to short time require for charging of Vehicle. The Device now works with a limited connection but there are many types of charging and in a future we can increase the connections.

FUTURE SCOPE :

1. The expansion in charging technology infrastructure such as fast charging, wireless charging will enhance efficiency and regulation of the E-Vehicle owner.
2. We can install the charging station in working places, highways or residential buildings, Industrial sectors, malls to accessibility of charging of Vehicle.
3. By applying smart technology RFID Module, IOT AI and data analysis will manage the energy generation and use of energy Charging station, optimization of energy uses and billing process.
4. Collaboration with Government and utilizers, marketers it can be standardization ecosystem.

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