

# Electric Vehicles charging Station using Solar Panel and Wind Energy

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**Abstract-** Normally vehicles required fossil fuels which produces large amount of air pollution. To solve this problem electrical vehicles are available but it again requires electricity which is generated by using coal, fuels and it produced large amount of co2 and co related emission.

As Renewable Energy sources are increasingly identified as important and Non-renewable energy sources are day by day getting decreasing. In this system we are use a technology for charging electric vehicles through solar and wind energy. The renewable sources such as wind and solar are easily available everywhere by using vertical wind Turbine which will start rotating and generate electricity. Simultaneously solar panel generates electricity in daytime. In this way Energy generated can be use to charge batteries in vehicles. For this Charging stations are necessary. In this system we are providing charging stations at road signals, road side area also in parking areas. To display the nearest charging stations for charging electric vehicles we are developing a website in the proposed system

**Keywords-** Electric Vehicles, Solar panel, Wind turbine

## I. INTRODUCTION

The vehicles have been start using petrol they are producing large amount of pollution and harmful gases. The crude oil has been required in vehicles which can be import from other countries. To solve this problem there are many option available in market like, electric vehicles, which have been utilized in the 1990s. Their dispersion into the vehicle market has not been up to the mark because of the reason that it is less cost effective and these vehicles need to recharge once in 60 to 70 km drive.

Nowadays, the park stations, roadside units, and the standard home outlets are used to charge the battery packs of Electric vehicles. The plug-in EVs are used to reduce the pollution and get pollution free area. Electricity can generate by using renewable sources such as solar and wind energy in which wind turbine are used to generate wind energy and stored it well. The solar energy is generated by using solar panel. Both energies are used to charge the Electrical vehicle. This energy can be control the system to increase the amount

of power which is generating by wind energy. The NodeMCU is used to calculate the voltage and current to measures how much current and voltage is available.

The nodeMCU is connected to Voltage and current sensor to measures how much current and voltage is available. LCD display is used to show charging in percentage and also website is design to display the same. At the same time any person need to charge the vehicle then he/she find the charging station from the website. From the website it is easy to found the nearest station to charge the vehicles.

Website shows how much charging is available at that charging station. This system is reducing the effort and manages the time. This system is using full of solar and wind energy. The solar system is fully utilizing the solar energy but when it is not completely available then alternative option wind energy can be use to generate the electricity.

## II. LITERATURE SURVEY

Sr. No.	Year of Publication	Author Name	Paper Name	Remark
1.	2017	C. Chellaswamy, R. Ramesh	Future renewable energy option for recharging full electric vehicles. Renewable and Sustainable Review	Electric Vehicle charging stations make available energy to charge the EVs.
2.	2016	C. Chellaswamy, R. Ramesh	Investigation of wind energy potential and electricity generation for charging the batteries of electric vehicles	A novel charging mechanism utilizing this resources for automatically charging the battery packs of Electric Vehicle (EVs).
3.	2016	H. Fathabadi	Maximum mechanical power extraction from wind turbines using novel proposed high accuracy single-sensor-based maximum power point tracing technique	A new adaptive control algorithm for Maximum power tracking in wind energy system.
4.	2015	M. Van der Kam, W. Van Sark	Smart charging of electric vehicles with photovoltaic power and vehicle-to-grid technology in microgrid; A Case study	A distinct smart charging station for electric vehicle that is suitable for DC quick EVs.

### III. SYSTEM ARCHITECTURE

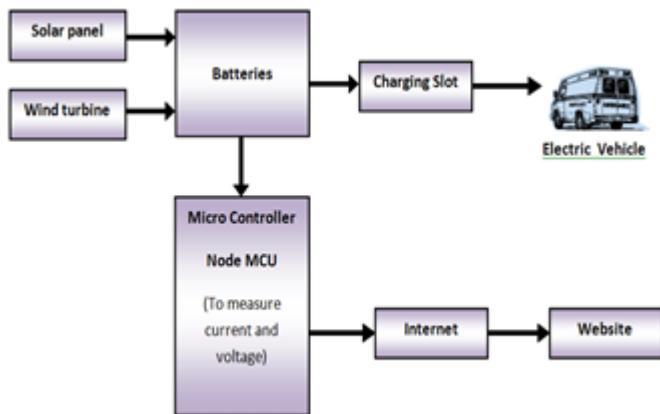


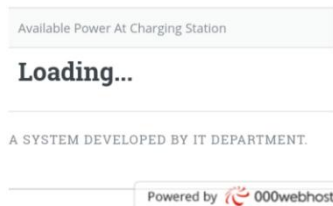
Fig. 1 : System Architecture

The system Architecture introduced by solar panel, vertical wind turbine, microcontroller (NodeMCU) and batteries.

In proposed system these are the main component which can be used to create energy for electric vehicle, by using this mechanism we can produce new renewable energy for charging stations. The energy generate through combination of solar and vertical wind turbine energy can be stored in battery. This energy is provided to electric vehicle. It is easily available for those people who are using electrical vehicle. In base station LCD is provided for displaying available charging and also same is display on website which helps to find nearest station.



Find Nearby Charging Station and Charge your vehicle:



The system consists of web page which the nearby charging stations to charge electric vehicles as shown in the below picture.

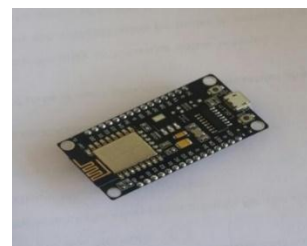
1. Solar panel: To generate electricity natural resource that is sunlight can be used. Solar panel can be directly convert energy from light into electricity. Solar system produces large amount of power. It can use for storing generated energy in battery packs.



2. Wind turbine: The natural resource that is wind energy also used for generating energy. It can be easily available in atmosphere. The wind turbine has wide range of vertical and horizontal axis. It easily rotate and produced electricity.



3. NodeMCU: The NodeMCU is one of the type of microcontroller. NodeMCU is connected to the battery which measures current and voltage. It can control whole process of the system.



4. Battery: Battery which can be used to store the energy that is useful anytime anywhere. In this system the Lead acid battery is used.



#### IV. ADVANTAGES

1. To control the air pollution and toxic gases.
2. For reducing the use of fossil fuel.
3. To reduce the use of non-renewable source.
4. Less maintenance is required.

#### V. DISADVANTAGES

1. Sufficient amount of wind and solar energy required.
2. Electric vehicle charge only at charging station.

#### VI. APPLICATIONS

1. Energy generated can be used for mobile charging.
2. For Vehicle charging base station can be implements at road side area, parking etc.
3. Solar and wind energy base inverters for battery.
4. Charging station can used to charge all type of vehicles.

#### VII. CONCLUSION

Currently Energy-saving emission reduction is main purpose of the using electric vehicles. The new recharging system for electric vehicles is proposed using solar and wind energy. The usage of electric vehicles is directly affected by the previous charging technique because recharging stations are necessary for longer drive vehicles. The travelling distance depends on the capacity of energy storage present in the vehicle. So it is necessary to have recharging stations at vital locations. In this system charging stations are located at signals, road side areas. Also the developed system gives the information about nearest charging stations. The batteries in the charging stations are charged through natural resources i.e. solar and wind energy. So in this way use of fuels is getting reducing also it helps to control the Air pollution.

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