RENEWABLE ENERGY (WIND) BASED AUTOMATIC RECHARGING SYSTEM FOR ELECTRICAL VEHICLES WITH BATTERY INFORMATION SYSTEM USING IoT

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Keywords:

Electric Vehicles, Synchronous Generator, Recharging Mechanism, Wind Energy, Arduino IoT cloud.

Introduction:

This project describes the wind Energy based charging mechanism (WCM) to generate the power for charging the battery packs of electric vehicles (EVs). The WCM immensely reduce the requirement of fossil fuels to generate electricity which results in greatly reduced CO2 and CO related emissions. This project describes the renewable sources for instance the wind generator and utilized to produce power to recharge the electrical vehicles (EVs) storage system automatically. In this project, we will build a Battery Status Monitoring System using ESP8266 & Arduino IoT Cloud. Using this System. we can monitor battery voltage and percentage from anywhere in the world. Therefore, this system is useful for monitoring battery charging/ discharging status remotely.

Problem Statement:

“Looking at the rapid increase in world population and further increase in number of circulating cars, it’s found that more than 70% of environmental pollution is caused by cars using traditional source of energy for power. Nowadays, with the global concern for greenhouse gases and environmental pollution, electrical vehicles are being developed in quick paces for both private and commercial purposes. “To dominate the cost of installing the EV charging points and to make the rechargeable electrical vehicles Cost-Efficient and Eco Friendly by using Renewable energy(wind) based automatic recharging system for electric vehicles with battery information system using IoT".

Objectives:

1. To develop an efficient and cost-effective auto EV battery recharging model.
2. To develop a battery model for EV with continuous charging feature through wind turbines when vehicle moves.

Methodology:

Wind turbines: The wind turbines are placed in front of the vehicle, as the car moves the wind which blows in the opposite direction makes the turbines to rotate.

DC Control unit: A DC motor controller manipulates the position, speed, or torque of a DC-powered motor and easily reverses, so the DC current runs in the opposite direction.

Charging Module TP4056: The TP4056 chip is a lithium-Ion battery charger for a single cell battery, protecting the cell from over and under charging. It has two status outputs indicating charging in progress, and charging complete.

After this process, the information regarding the battery will be stored in IoT cloud, we can access remotely anywhere through mobile phones.

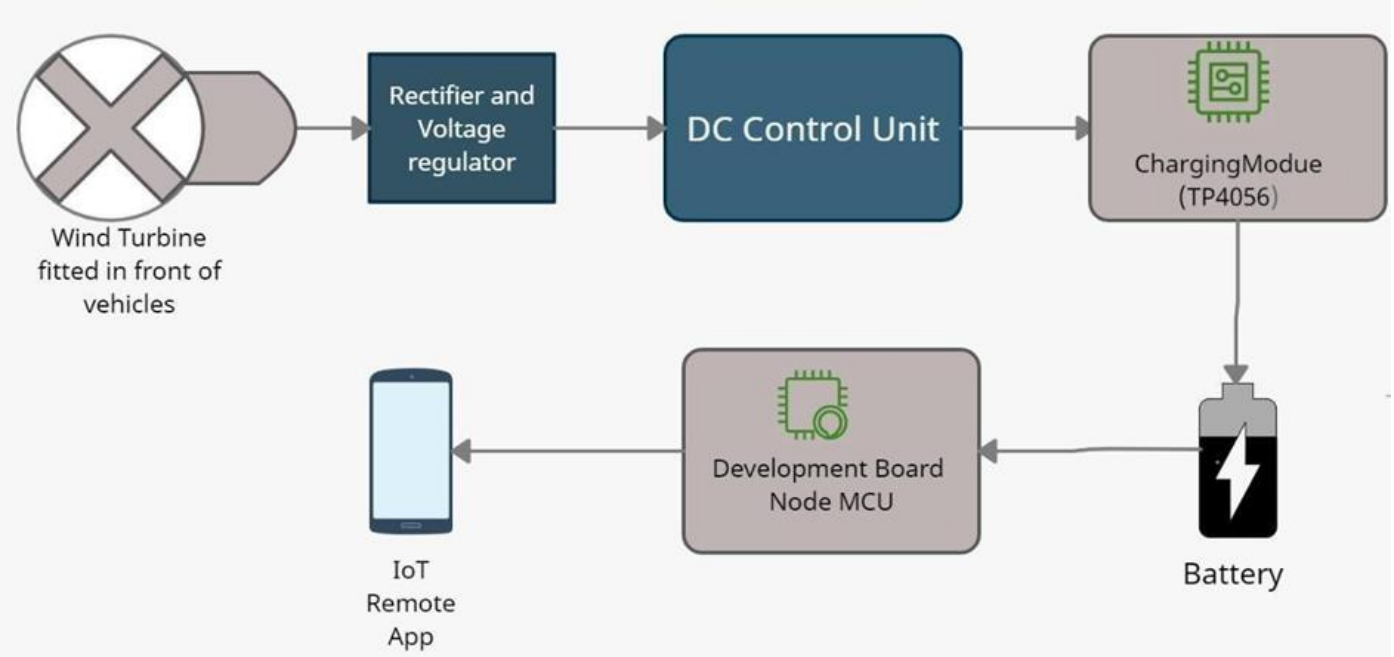
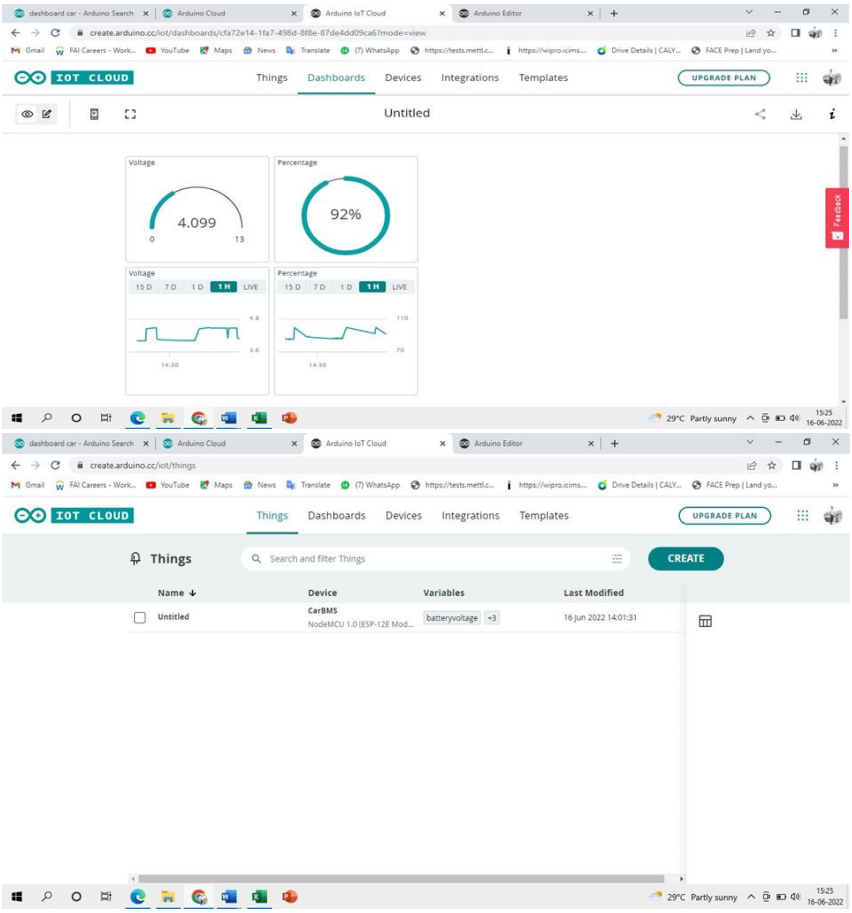


Figure 1: Flow Diagram

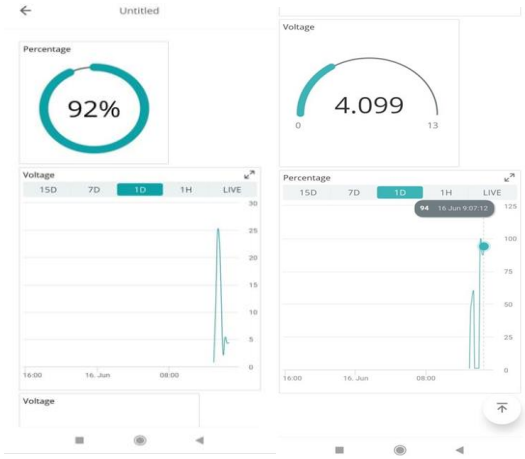
Results and Conclusion:

Output Snapshots:

Output on Website



Output on IoT Remote App



Scope For Future Works:

The future advancement of this application may be the followings:

1. In India still the electric vehicles are not so popular yet, and TATA motors is planning to launch electric cars in coming days.
2. The installation of EV charging points in rural areas is challenging, we can overcome this by “Auto Rechargeable Electric Vehicle System” and we can make them easily manageable at low cost.
3. Customers can enjoy the safe ride without thinking about recharging the battery.