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SMART EV CHARGING STATION CONTROLLER DESIGN AND ANALYSIS USING MATLAB

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ABSTRACT - With the push to move to electric mobility at a national scale, and with the government being very enthusiastic about deployment of electric vehicles, the electronic industry can expect to see a lot of activity about production and development carried out by native people.Major automakers are working on electric vehic les, but an ecosystem for software and cloud services, chargers, and charging stations is also being developed st eadily.Results are beginning to emerge from the work that established businesses and several start-ups have been doing in these sectors.On the other hand, there are still plenty of opportunities to improve the ele ctronics component.Technical specifications for charging stations have already been released by the governmen t with assistance from BIS, ARAI, EESL, and other organisations. The AC-001 and DC-001 specifications, for example, already been developed and charging stations have been deployed at select locations. The newer guidelines require the charging stations to be equipped with multi standard chargers, viz. AC Type 2, the CCS and the CHADEMO, in addition to the lower power AC and DC-001. However, these systems are reliant entirely on the grid, are subject to real estate availability at prime urban and semi-urban locations, and the question of the grid being ready and equipped for these added loads, still remains. This is where, solar energy and storage comes into picture to not only supplement the grid but to also work standalone at feasible locations across the country.

I. INTRODUCTION

One essential component for the maintenance of life's contents is electricity.Its appropriate usage necessitates its c areful application.However, there are many places in our nation where there is an abundance of power, while man y other locations do not even have access to it.Since power theft persists and we are still unable to accurately predi ct our exact requirement, our rules regarding its distribution also bear some of the blame for this.However, custom ers are likewise dissatisfied with the services provided by electricity firms.They typically complain about statistica l inaccuracies in the monthly bills.This allows us to keep an eye on the metre and determine whether a defect exist s. In the prior metreBut our meter works on pulse which is created according to consumption and we previously connected android board which monitor the pulse and according to pulse the bill is generated. With the help of this project we are aiming to receive the monthly energy consumption from a remote location directly to centralised

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office. In this way we can reduce human efforts needed to record the meter readings which are till now recorded by visiting every home individually. The meter reading and management processes are free from human involvement. Accuracy, speed, efficiency, and cost-effectiveness are the expected benefits achievable using the AMR system. The overall system is based upon the existing telephone networks, therefore the service can reach anywhere there is a telephone. All this is accomplished electronically and truly automatically, thus ending manual (and semi-automatic) meter reading and entry, call-backs, reading errors, and billing floats. The AMR system should provide 100 2) Data Collecting from Smart Meters in an Advanced Metering Infrastructure: The classical solution for collecting data from energy meters, based on displacements of peoples, tends to be replaced by modern solutions: drive-by and Au- tomated Meter Reading (AMR). Drive-by means that data are collected by mobile devices which pass near the meters. The personnel are considerably reduced and manually readings and records are eliminated. AMR means to automatically collect data from meters and send them to a central computer.

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II. METHODOLOGY

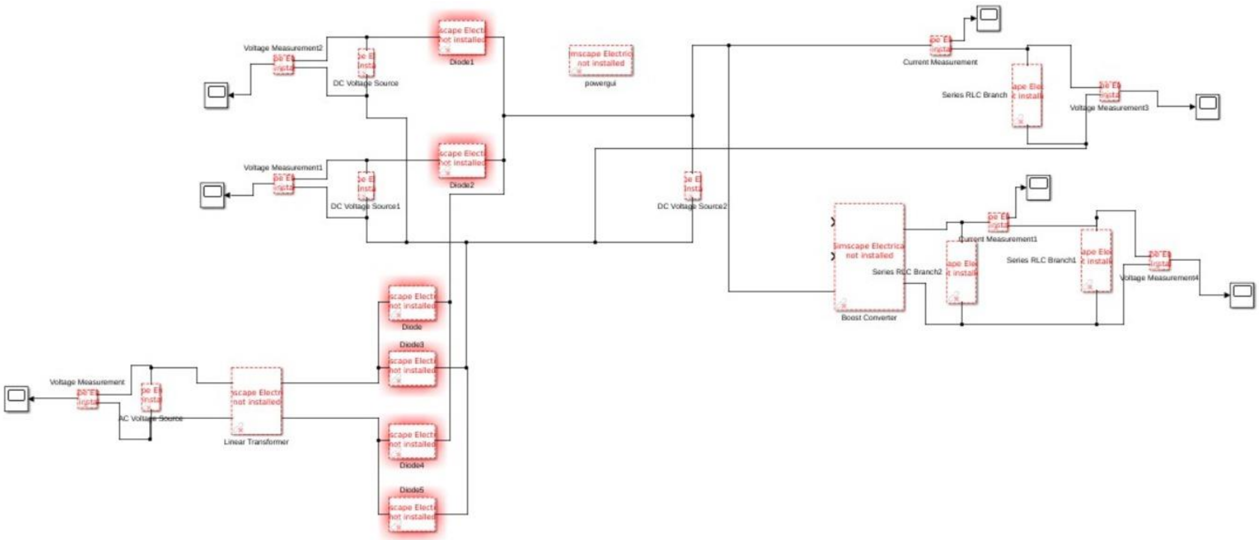


Fig 1-. Testing model

III. BLOCK DIAGRAMME

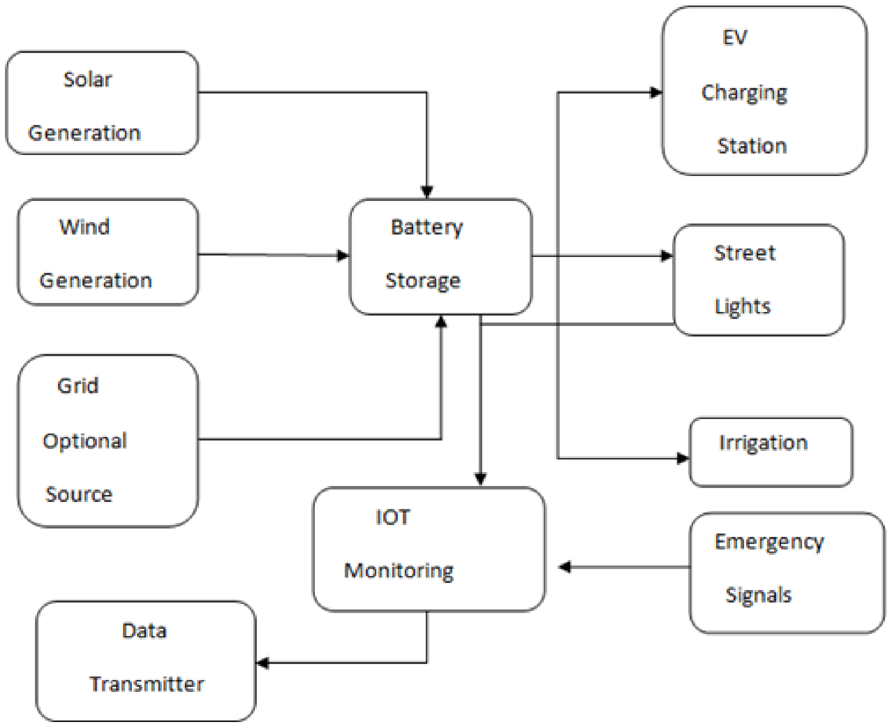


Fig 2- Block Diag.

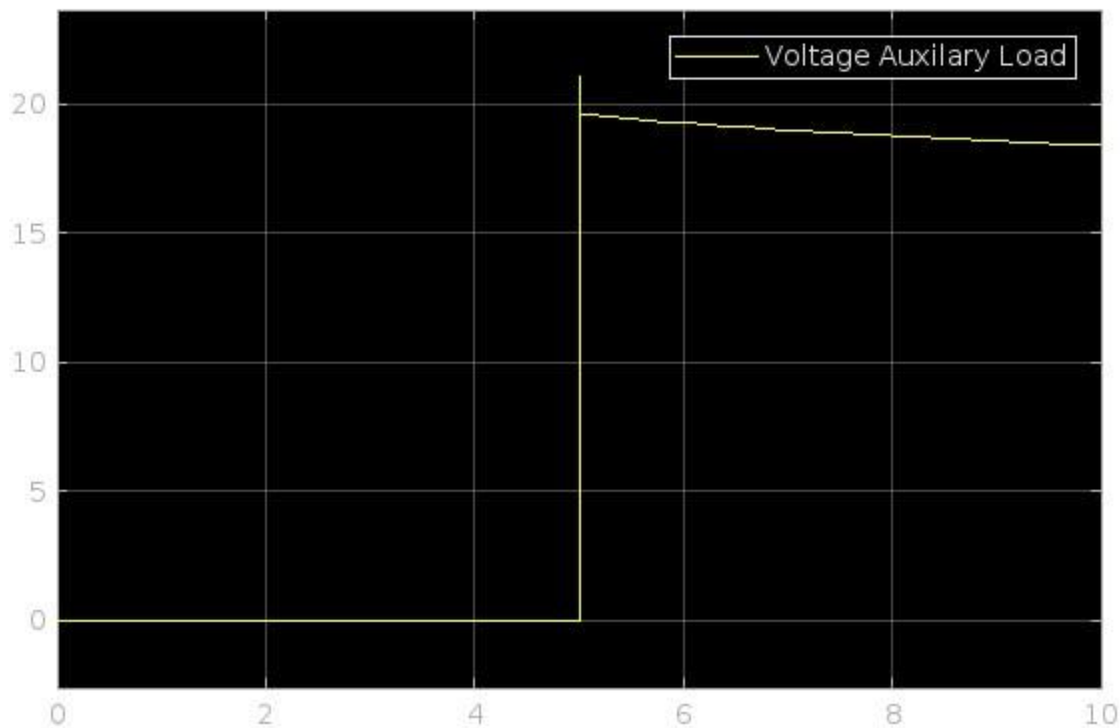
B. Hardware Implementation

1. Solar power is the conversion of energy from sunlight into electricity, either directly using photovoltaics (PV), indirectly using concentrated solar power, or a combination. Concentrated solar power systems use lenses or mirrors and solar tracking systems to focus a large area of sunlight into a small beam. 2. This is a multipurpose project that integrates all the functions including a prepaid billing arrangement and automatic message sending system to the utility company.
2. Wind turbine
3. wind power generation means getting the electrical energy by converting wind energy into rotating energy of the blades and converting that rotating energy into electrical energy by the generator. Wind energy increases with the cube of the wind speed, therefore WTGs should be installed in the higher wind speed area.
4. Grid power source : The transmission grid comes to an end when electricity finally gets to the consumer, allowing you to turn on the lights, watch television, or run your dishwasher
5. Battery :A battery storage power station is a type of energy storage power station that uses a group of batteries to store electrical energy.
6. IOT monitoring :The Internet of Things (IoT) unites physical objects with the virtual world. Smart

devices and machines are connected to each other and the Internet.

7. EV Charging station :Like a smart phone, charging an electric car is really simple, just plug it in. But the size of the battery means it takes a lot more electricity, and a lot more time off of a standard outlet, to recharge

IV. RESULT



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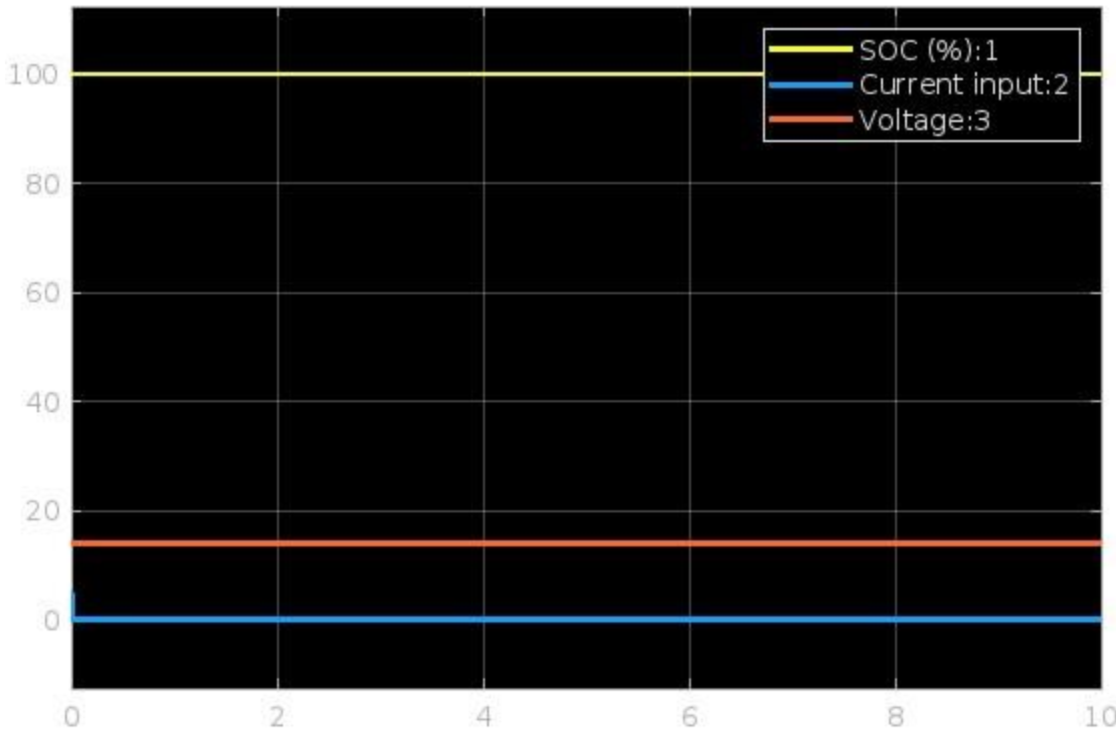

Fig.3 - Result

V. CONCLUSIONS

This chapter proposes a DC microgrid and an effective energy management system.With the exception of the D C load, every component of the DC microgrid is built for a decentralised PI controller. Depending on the energy management control approach, this controller is implemented utilising local voltage and current information for hybrid energy sources (wind, solar PV, and solar energy) and BESS.One benefit of this suggested energy mana gement control approach is that it eliminates the need for a communication link between the microgrid's local co ntrollers. Thus, the energy management level achieves the DC microgrid's dependable operation. To assess the effectiveness of the proposed energy management control scheme, different operating modes are considered and simulated based on the different constraints of hybrid sources and BESSs. The simulation results show a stable operation of the DC-bus voltage while maintaining an effective power balance under different operating points of DC microgrids. Thus, the proposed energy management control strategy has the ability to maintain efficient control coordination among the hybrid energy sources, BESSs, and loads to support stable operation of DC microgrids. In future works, the proposed energy management control strategy will be implemented in a laboratory-based real-time platform.

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