International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 03 | Mar 2019 www.irjet.net p-ISSN: 2395-0072

A SMART MONITORING SYSTEM FOR HYBRID ENERGY SYSTEM USING IOT

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Abstract *- In this paper, we presence a novel energy harvesting and management technique to Hybrid power system the IOT, which does not require any long-term energy storages nor voltage converters unlike traditional energy harvesting systems. The main focus is switching between two energy sources , i.e. solar and wind energy without any inconvenience through an Android App with the help of Wi-Fi module .The data is transmitted wirelessly through android app to ESP 32 module which controls the sources of energy. The transmitted data is controlled remotely using IOT. This enables user to have flexible control mechanism remotely through a secured Mobile App .This system helps the user to control the sources of energy, manually and remotely using smart. This system is very efficient, cheaper and flexible in operation.*

Key Words: IOT, Controlling of Hybrid System,ESP32, Android app.

1. INTRODUCTION

Energy is the basic need for development and the requirement of energy is more due to the rapid increase in world population, technology and other political and economic condition. Now a day's electrical energy is generated by the conventional energy resources like coal, diesel, and nuclear etc. and these are depleting day by day. So, there is an urgent need to switch on to non-conventional energy resources. Solar and wind are easily available in all condition can be good alternative source. With the rise in the demand of renewable energy resources the need of concentration of these system should be essential. This in turn has given rise to the hybrid energy system .Combination of two or more energy system is called hybrid energy system. Here, two sources are used solar and wind energy. In order to control the hybrid system IOT can be used. IOT (Internet of Things) is the inter-networking of physical devices embedded with electronics, software, sensors and network connectivity that enable objects to collect and exchange data. IOT is used to switch the power supply i.e., wind energy and solar energy of a house through secure website when the grid supply is off. This prototype is to control the switching between these two sources of energy. With this advanced technology provide sensors, metering, transmission, Distribution, and flexibility to consumers of electricity.

1.1 SOLAR-WIND HYBRID ENERGY SYSTEMS

Energy resources are classified into two ways:

Non-renewable Energy: Resources which are limited in quantity and can be depleted after few years. Example: Petroleum, Natural gas, Coal etc.

Renewable Energy: Resources which are abundantly available in nature. Example: Solar energy, Wind energy, Tidal energy etc. Hybrid electricity generating system

1.2 EXISTING SYSTEM

The solar-wind power system is the renewable energies which generate electricity .The data is directly transmitted wirelessly through ESP8266 module which controls the energy sources. The transmitted data is easily controlled by remotely using IOT.

DRAWBACKS

- Power measures using measurement devices in man power.
- Still now existing the separate energy generate source monitoring system.
- Power measurement using RF and GSM communication

1.3 PROPOSED METHOD

The structure of the design and development of the proposed system is provided in the following sections. Describes the working description of developed system. ESP32 microcontroller module is used to transmit and receive the electrical data wirelessly, which is collected from internet through designed Android App and the Monitoring system. The ESP32 transmitter is interfaced with various sensing devices and reliable data reception at a receiver side of ESP32 development Board. The ESP32 dev board has been

interfaced through router which is connected to the internet via Wi-Fi. The Load can be monitored and controlled automatically. The controlling operation is performed in two ways. Those are Automatic controlling and remote monitoring. Automatic control: An on/off Relay and source change switch is automatically control to the system to the system. In this mode user can monitor the parameters of power source

ADVANTAGES

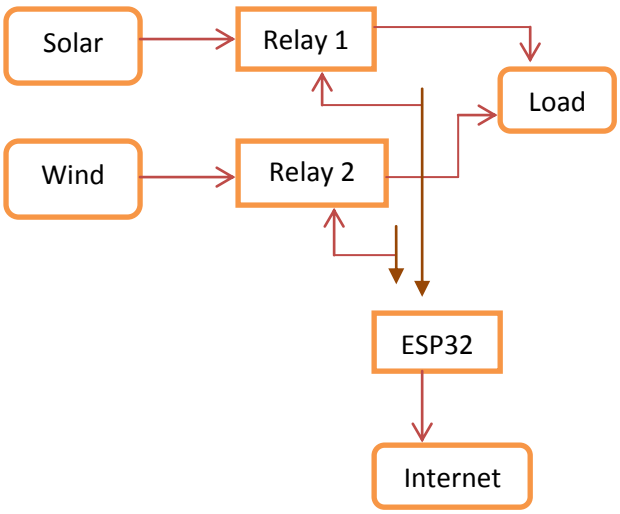
- Power generation is double
- Reduce the power demand
- Easy to implement
- Used in many areas
- Uninterrupted power supply

2. LITERATURE SURVEY

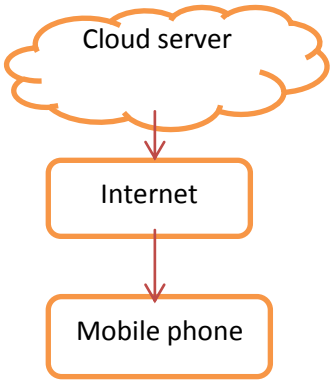
Solar energy and Wind energy are natural resources which are not depleted by use and are more popular. Availability and ease to obtain electric power made Solar and Wind power as alternative energy sources. Solar energy and Wind energy combined to form Solar-Wind Hybrid Power System (SWHPS), which will enhance the qualities of each other and another. To reduce the power demand on the conventional power generation sector, the optimized utilization of these natural resources is essential to produce power. Various methodologies are in practice for generation of power using Solar-Wind Hybrid System with Maximum Power Point Tracking (MPPT). Constant voltage method is used for maximum power transfer. This method should have some key features to increase the stability and efficiency. The hybrid system can eliminate the problem faced by energy generation due to individual energy source and helps to improve reliability and performance by using MPPT.

3. BLOCK DIAGRAM

3.1 Block diagram for hardware



3.2 Block diagram for software



3.3 POWER SUPPPLY

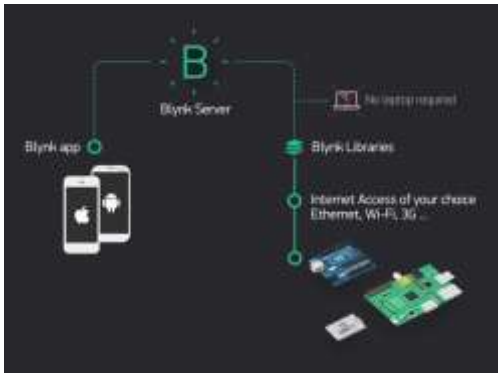
A **power supply** is a device that supplies electrical or other types of energy to an output load. The transformer steps down the input line voltage and isolates the power supply from a power line. The Rectifier section converts the alternating current into a pulsating direct current. A filter section is used to convert pulsating dc to a more desirable form of dc voltage. Regulator maintains the output at a constant level.

3.4 ESP 32 MICROCONTROLLER

ESP32 is a single 2.4 GHz Wi-Fi-and-Bluetooth combo chip. ESP32 is designed for mobile, wearable electronics, and Internet-of-Things (IoT) .In to Estabish connection between the mobile and the controller and so during emergency situation we can control the whole process with the mobile phone our model ESP32 is used as WI-FI module

3.5 BLYNK APPLICATION

Blynk is a platform with IOS and Android apps to Control Arduino, Raspberry Pi and the likes over the Internet. You can easily build graphic interfaces for all your projects by simply dragging and dropping widgets so here we used blink application to access control over mobile phone and to monitor the output. By using this blink application we can monitor how much power coming from solar and wind .we can also switch the power source using this application.



4. RESULT

5. CONCLUSION

In this project a hybrid power generation system is designed which shows different characteristics of the system. From the study of the model characteristics this hybrid power system provides voltage stability and automatic load sharing capability. This is the reasons why the system is very much useful to provide power.

6. FUTURE STUDY

In this project a hybrid power generation system is designed which shows different characteristics of the system. From the study of the model characteristics this hybrid power system provides voltage stability and automatic load sharing capability. So the system is useful to provide good quality of power.

7. APPLICATION

- Applicable in high wind flow areas
- Applicable in high sun light areas.
- Applicable in home, all buildings, waste lands

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