

Base Transceiver Station Powered By Renewable Energy Resources

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Abstract- In day to day life the consumption of power is increased because of the increase in our needs and comforts. So, it is vital to produce power as its rise in demand. This project is to generate the power from solar energy and wind energy. The base stations represent the main contributor to the energy consumption of a mobile network. The power obtained from the generation can be used for the needs in any system. All the conventional energy resources are depleting day by day. So we have to shift from conventional to non-conventional energy resources. The economic problem of providing electrical energy to mobile BTS stations may be solved to a great extent if renewable energy resources are used. In remote areas, where electric utility is not available, photo voltaic (PV) and wind energy provides power to the base station. The installation cost of solar panel and wind mill is high but the maintenance cost of the system is low when compared to generator. Basically this system involves the integration of two energy system that will give continuous power. Solar panels are used for solar energy to electrical energy. The electrical power can utilize for various purpose. Generation of electricity will be takes place at affordable cost. This paper deals with providing electricity by solar energy and wind energy with affordable cost without damaging the natural balance.

Keywords- Electricity, Hybrid, Solar Power, wind, base transceiver station.

I. INTRODUCTION

Electricity is most needed for our day to day life. We can generate electricity by two energy resources. The first one is conventional energy resources and another one is non-conventional energy resources. The consumption of power is increased because of increase in our demands and comforts. Now a days the electricity which is generated by conventional energy resources like coal and diesel which produce some waste like ash in coal power plant and nuclear waste in nuclear power plant. It also destroys the greenish environment and it creates more pollution to the environment. It causes more damage to the environment so

we need to find alternate solution to provide power to the base station which will not affect the environment with affordable cost. So in our project we are going to generate electricity by renewable energy resources that will not affect the environment. From the solar and wind we are going to generate power and that power is given to the base transceiver station (BTS). Solar and wind energy available at all conditions. So this method is easy to generate electricity. We can use two energy resources so that any one of source fails other source will keep generating. And in good weather condition we can use both sources combine. In the unavoidable conditions, we can use battery to generate electricity to the base station. The unexpected increase in subscribers forced the mobile communication company to increase number of mobile base stations (BTS), which serve number of Subscribers. BTS loads can be vary from month to month. BTS loads different from one BTS to another BTS according to BTS configuration type and subscribers density. As the demand increase the generation of power also increases. So it is important to generate electricity with the renewable energy resources which will not affect the environment.

1.1 EXISTING SYSTEM

In the existing system, they are using the fixed solar panel which gives only maximum output for minimum time only. In proposed system we are going to achieve maximum output for maximum period of time. At the same time the battery will provide energy only for two hours. But in our project we are going to provide power for 84 hours.

1.2 PROPOSED SYSTEM

Figure 1.2 shows the hybrid system. Hybrid energy system is the combination of two energy sources that is solar energy and wind energy. If we are giving power to the base station by two energy resources then it is called as “**Hybrid energy system**”. This hybrid system has good reliability, efficiency, less emission, and lower cost. In this proposed system solar and wind power is used for generating power. Solar and wind has good advantages than other

than any other non-conventional energy sources. Both the energy sources have greater availability in all areas. It needs lower cost. There is no need to find special location to install this system.

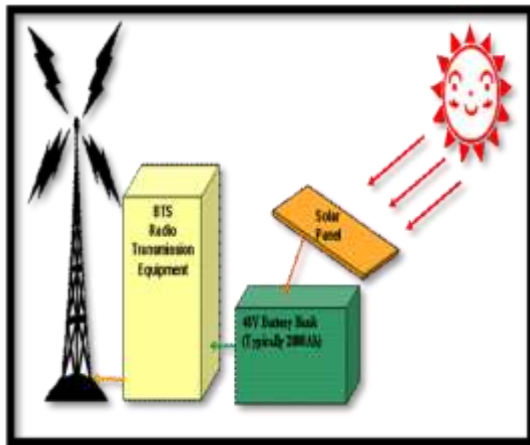


Figure 1.2 Hybrid system

i. Solar Energy: Figure 1.3 shows solar panel.

A photovoltaic module is composed of the individual PV cells. This crystalline silicon module has an aluminum frame and glass on the front. In the field of photovoltaic a photovoltaic module is a packaged interconnected assembly of photovoltaic cells, also known as solar cells. An installation of photovoltaic modules or panels is known as a photovoltaic array. Photovoltaic cells typically require protection from the environment. Solar energy is that energy which is gets by the electromagnetic radiation of the sun. Solar energy is present on the earth continuously and in abundant manner. Solar energy is freely available. It doesn't produce any gases that mean it is pollution free. It is affordable in cost. It has low maintenance cost. Only problem with solar system it cannot produce energy in bad weather condition. But it has greater efficiency than other energy sources. It only need initial investment. It has long life span and has lower emission



Figure 1.3 Solar panel

ii.Wind Energy:Figure 1.4 shows wind mill. The principle of wind turbine generator(WTG) and its control system based on

peripheral interface controller (PIC). The wind energy is converted into electrical energy by WTG. Because of the uncertainties of the speed, the direction of the wind, and the large inertia of the wind turbine of WTG, reliable control strategies are adopted to assure the WTG to run normally under serious conditions by using PIC. The wind energy needs less cost for generation of electricity. Maintenance cost is also less for wind energy system. Wind energy is present almost 24 hours of the day. It has less emission. Initial cost is also less of the system. Generation of electricity from wind is depend upon the speed of wind flowing.



Figure 1.4 Wind energy

II. BLOCK DIAGRAM

This figure 2.1 shows the block diagram of proposed system.

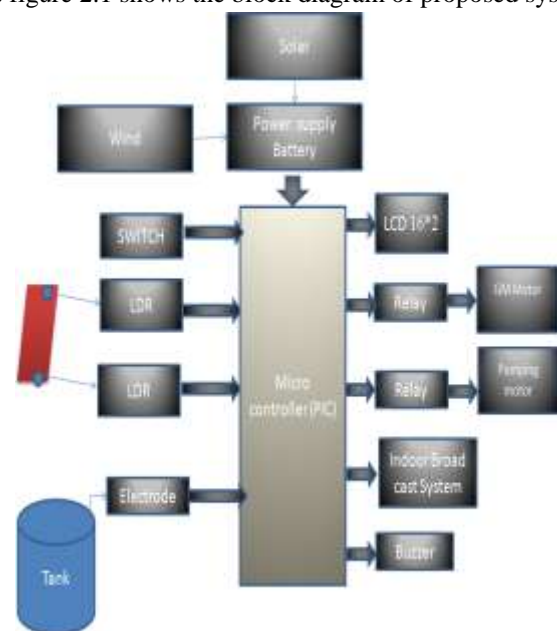


Figure 2.1 Block diagram

III. WORKING

i.**PIC (16F877A)**:Figure 3.1 shows PIC microcontroller.The microcontroller used here isPIC which is initially referred is PERIPHERAL INTERFACE CONTROLLER.It has 33 I/O pins, 5 I/O ports.PICs have high performance RISC CPU as it operating frequency DC 20Mhz clock input and 200 ns instruction cycle.They also have peripheral and analog features. 20 MHZ , 20ns instruction cycle.Its operating voltage is 4.0 V- 5.5 V.PIC has 15 interrupt sources and 35 single word instructions.it can self-reprogrammable under software control.



Figure 3.1PIC

ii.**LDR**: Figure 3.2 shows LDR.Here we used LDR Sensor. LDR is a light-controlled variable resistor. The resistance of a LDR decreases with increasing incident light intensity; in other words, it exhibits photoconductivity. A LDR can be applied in light sensitive detector circuits, and light- and dark activated switching circuits. Here we use this to track solar Panel based on sun direction. It works under the process of negative coefficient.



Figure 3.2 LDR

iii.**LCD**: Figure 3.3 shows LCD A 16*2 LCD display is very basic module and is commonly used in circuits.A 16*2 LCD means it can display 16 characters per line and there are 2 such lines.Each character is displayed in 5*7 pixel matrix.



Figure 3.3 LCD

iv. **Relay**: Figure 3.4 shows relay.Relay are switches that open and close circuits.Relay control one electrical circuit by opening and closing contacts in another circuit.Relay contact is normally open, there is an open contact when the relay is not energized.



Figure 3.4 Relay

IV. ADVANTAGES

In our project we are getting power from renewable resources, so that it will not affect the environment. Auto tracking of solar panel which is giving maximum output for a long time. PIC controller which has high RISC performance and it can be reprogrammed by software. Only initialization cost is high, the maintenance cost is low. It can be controlled by software itself.

V. HARDWARE SETUP

Figure 5.1 shows the hardware detailed about our proposed system.



Figure 5.2 Hardware setup

VI. APPLICATION

The power which is generated by the renewable resources can be given to the base transceiver station. It can also give power to the street lamps. This project help to avoid the harmful and pollution which the existing system failed to produce.

VII. CONCLUSION

It is cost effective solution for generation. It only need initial investment. It has also long life span. Hybrid power generation system is good and effective solution for power generation than conventional energy resources. It has greater efficiency. So that the power can be utilize where it generated so that it will reduce the transmission losses and cost. Cost reduction can be done by increasing the production of the equipment. People should motivate to use the non-conventional energy resources. It is highly safe for the environment as it doesn't produce any emission and harmful waste product like conventional energy resources. Overall it good reliable and affordable solution for electricity generation.

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