

# Solar and Wind Hybrid Power Generation System for Street Lights at Highways

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**Abstract-** Solar and wind hybrid power generation system for street light and highway used for mainly in smart city. In proposed system we cannot implement RFID system for the street light. Solar and wind turbine is the main part of this system. In this hybrid system we used LED as a light resources because of low power consumption. In India population growth rate is very high so energy requirement is also high. Because of this population it requires large amount of energy generation for this energy generation we cannot totally depend on non renewable energy resources. Renewable energy resources are free of cost and pollution free. We used the hybrid system that is totally pollution free.

**Keywords-** hybrid energy system, turbine system, street light, LED's, GSM, Battery source, RFID reader, RFID tag.

## I. INTRODUCTION

Solar and wind energy is the renewable energy sources it is the effective and conventional form of energy. This energy resources does not depend on the any other resources. solar energy is created when the day is begin and it stored in the battery and wind energy is created in day time and night time also using wind turbine it placed at the top of the street light.

This wind energy is created by motion of the wind turbine. Renewable energy resources must be utilized as much as possible to cut down the demand rate and it's non polluting. We also placed the RFID reader on every street light that reader reads the information of the user by swapping the RFID tag, this tag is containing the user information like name, birth date, address etc. This information is transmitted through GSM and sends to the stored mobile number to the specific hospital. At present, the issue is how to utilize and manage these resource. This paper is proposed to overcome and enhance the power management at highway.

RFID was first considered to the commercial world, RFID products started to the available in 1980's and its wider spread usage was only in recent years. RFID applications were mainly applied to identifying assets in a single location.

Radio Frequency Identification (RFID), Which uses radio waves to wirelessly transmit the identity using the unique serial number and the information of an user.

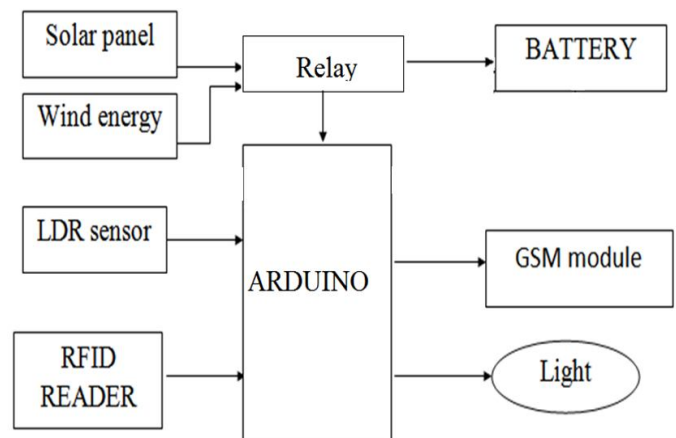


Fig..Block diagram of hybrid power generation

## II. WORKING OF WIND ENERGY

At Highways there is availability of wind by motion of moving vehicles. When a free moving air particle is distributed by forceful object succeeding is its path a pressure is developed at the body of the body of the object and it is delivered to the surrounding near objects. By this phenomenon wind turbine is placed on the top of street light. The wind turbines are not placed in vertical path, but horizontally.

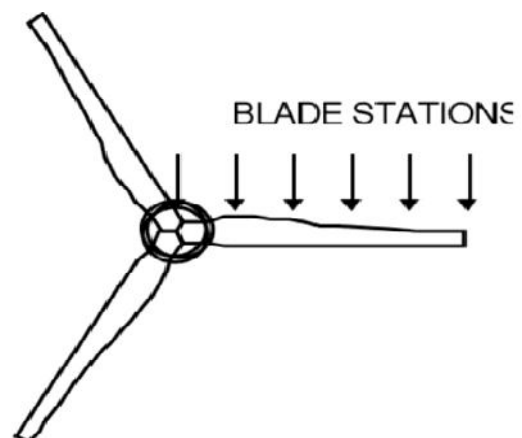


Fig.1, Top View of Wind Generating System

### III. WORKING OF SOLAR ENERGY

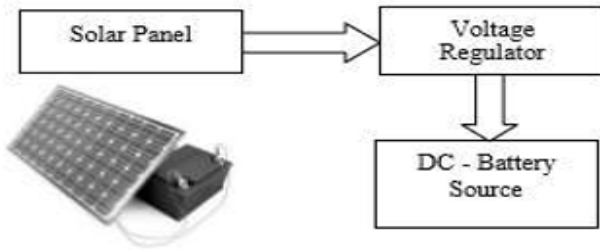


Fig. solar energy system

The solar energy is renewable source available for the entire world for few times .solar power is generated at day time from at 8am to 6pm. At a scientist or researchers point of view it utilized 44.4% of energy from the solar.solar energy is pollution free because it doesn't produce any gases. solar energy is light energy which gets by the radiation of the sun.it has greater efficiency and it need only initial investment.

### WORKING OF RFID

RFID is radio frequency identification it works with the help of RFID reader and RFID tag. In our project RFID plays an important role with considering security. Any user if swapping any RFID card that is nothing but the tag it reads by the reader and this information is sends through the GSM.

### IV. RESULTS

#### When light intensity is Low –

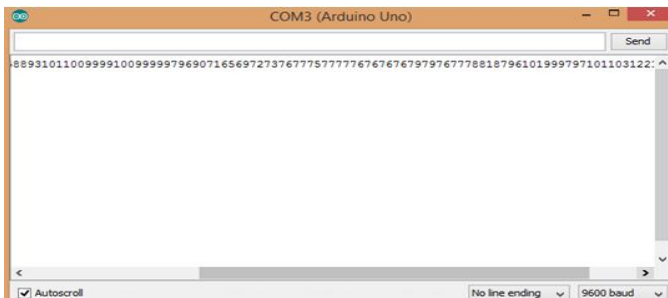


Fig..Light Intensity Result

When intensity of light is low (night) then the value of intensity also low =88 93 101

The result shows when the light intensity is low(night time) that decrease the value of intensity and street light will be on that time .In the program we mentioned the value 400 if the intensity above that value light off and that value is less than that value light turn on.

#### When light intensity is high -

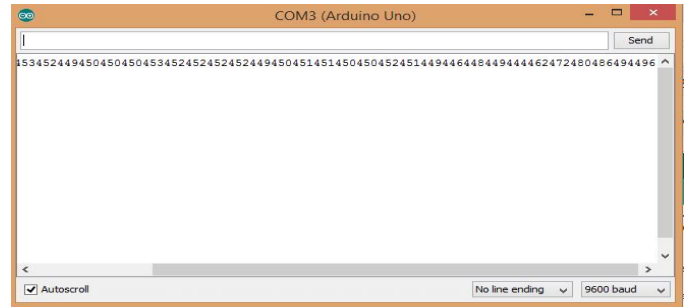


Fig. Light Intensity Result

When the intensity of light is high (day)values of intensity also high =449 450 453

The result shows when the light intensity is high(day time) that increases the value of intensity and street light will be off that time. In the program we mentioned the value 400 if the intensity below that value light turn on and that value is above than that value light turn off. This all procedure is sensed by LDR sensor.

### RFID Result

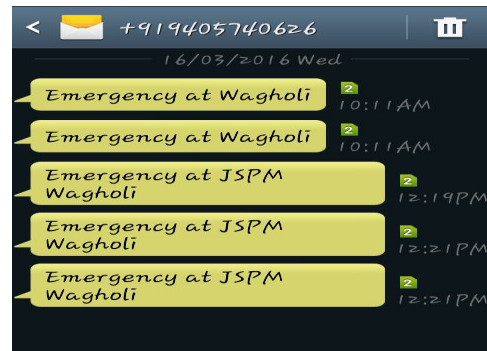


Fig. SMS received through GSM

In case of emergency any user swaps the RFID card through the RFID reader. That reader reads that user data and that data sends to the mentioned hospital address through the GSM. GSM uses the AT command for sending message to particular hospital. That message is displayed on the mentioned number in program.

### V. ACKNOWLEDMENT

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## VI. ADVANTAGES AND APPLICATION

### ADVANTAGES

- 1) Large application areas,
- 2) More battery life,
- 3) Most cost-effective in windy areas,
- 4) Easier installation & Maintenance.

### APPLICATIONS

- 1) Street lights
- 2) Railways
- 3) Bus
- 4) Private apartment

## VI. CONCLUSION

The project work presents the solar and wind hybrid model is used to full fill energy demand. We used the solar and wind hybrid model for glowing the street light on the highway. This both solar and wind energies are converted into electrical energy and glow the light. In this hybrid model RFID plays an important role for the security and it is used as an emergency purpose.

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