IoT Based Smart City

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Abstract : **In day to day life electricity is the main need of human being. In this world all conventional energy sources are vanishing. So we have to use non conventional energy sources instead of conventional energy sources. All conventional energy sources are polluting the environment. The most percentage of energy of non conventional energy sources are producing from solar and wind power plant. This power plant produces energy without damaging the nature. With the help of hybrid power plant we can produce long time power. This system consisting of the integration of two energy system that will give continuous power. Solar panels are used for converting solar energy while wind turbines are used for converting wind energy into electricity. This electrical power can be utilize for various purpose. So the generation of electricity is produced with affordable cost. This paper consist the generation of electricity by using combination of two generating sources which leads to generate electricity with affordable cost without damaging the nature balance.**

IndexTerms **–DC motor, Battery, Solar Panel, Ultra Sonic Sensor, Fire detector, Photodiode sensor.**

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I. INTRODUCTION

An use of intelligent street lighting system save the cost of municipal, about 50% - 70%. An intelligent street lighting system is work on bases of usage and occupancy, i.e., automating classification of pedestrian versus cyclist, versus automotive. The street lighting is one of the largest energy expenses for a city. IOT utilizes existing and emerging technology for sensing, networking, and robotics. The reason behind this is that smart cities include sensor networks and connection of intelligent appliances to the internet is essential to remotely monitor their treatment such as power usage monitoring to improve the electricity usage, light management, air conditioner management. To get this aim, sensors are able to be extended at various locations to gather and analyze data for utilization improvement. An intelligent street light management proposes the establishment of the wireless based system to remotely track and control the actual energy consumption of the street lights and take Proper energy consumption decrement measures through power conditioning and control.

II. ELECTRICITY GENERATION

2.1 HYBRID POWER GENERATION

Hybrid energy system is consisting of two energy sources for giving power to the load. Hybrid energy system has the properties like as reliability, efficiency, less emission, and cheap than other systems. These hybrid system is more advantageous than other systems. So hybrid system will be designed for delivering continuous power over the wide range of appliances. The design of the system is composed of a wind generator, a solar panel, a charge controller, a battery and an inverter. Both solar and wind generation output is dc, it is further stored in battery, and when needed it is taken from the battery.
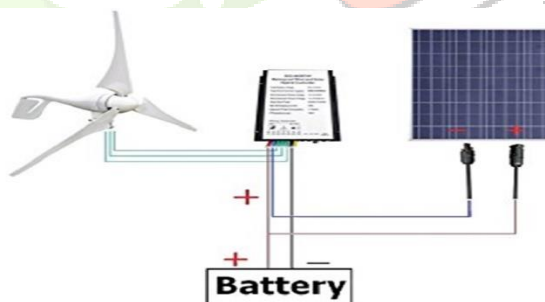

Fig 2.1 hybrid power generation block diagram

When the reflection of the sun rays is emits on the solar plate modules it produces the solar energy and that energy is stored in battery. This is the pollution free system because it doesn't produces any type of gases. It has low maintenance cost, time consuming system, affordable cost. But problem is that it cannot produce the power in bad weather condition. Wind energy is available almost for 24 hours of the day. It has less emission, low initial cost . The major factor for the generation of electricity is the speed of wind flowing. The disadvantage is when we uses the independent renewable energy resources it gives unavailability of power for all time. For overcoming the problems here we used the combination of solar and wind in the system.

The main motive of the garbage monitoring system is to keep the cities clean. This is very innovative system. This system helps the garbage bins and it also informs about the garbage level collected in the garbage bins via a web page. The ultrasonic sensors are used in this system which are placed over bins to detect the garbage level and relatively compare it with the garbage bins depth. AVR family microcontroller, LCD screen, Wi-Fi modem for sending data and a buzzer are used in the system.12V transformer is gives power for the system. The status of the level of garbage collected in the bins is displayed on the screen.

2.2 INTELLIGENT STREET LIGHT SYSTEM

The purpose of an intelligent street lighting system is saving of energy. When the vehicle pass from the road the sensor senses the LED and light is switched on automatically. The major equipments used are IR sensors, LDR, PIC16F877, microcontroller, Relay, UART and Wi-Fi Module. A UART (Universal Asynchronous Receiver/Transmitter) is the microchip using the programming that controls a computer's interface which is attached to the serial devices.

The street light controller should be installed on the pole lights consisting of microcontroller along with various sensor and wireless module. The street light controller is installed on the street light pole which controls LED street lighting depending on traffic flow, communicate data between each street light. The control system will switch on-off the lights at required timings and can also vary the intensity of the street light according to requirement.

2.3 RADIO FREQUENCY IDENTIFICATION (RFID)

Radio frequency identification provides some of the applications in safety of peoples, which includes tracking and localization of objects, healthcare applications, parking lots and asset management. The RFID which includes the readers and tags has a noteworthy task in the context of the IOT. Each tag can be as a sensor because they have not only data which is written but it also capture the data like environmental information. Technologies employed on each related thing, accomplishing their automatic identification and dedicating the single digital identity to any of the things will be possible, to include the network associated with the digital information and services.

2.4 GARBAGE MONITORING SYSTEM

In this system we use the ultra sonic sensor to detect the depth of garbage bins, so after filling the garbage in that bins it will sence the depth of bins are reduced as compare to empty garbage bins. Then the sensor indicates on the screen in what percentage the bins are filled. With the help of that we can collect the garbage from the garbage bins to avoid the pollution. For Additional safety purpose of human being fire detector is also situated between the garbage bins.

All this information of voltage generated by solar and wind power plant, stored energy in battery, garbage level in garbage bins, etc.
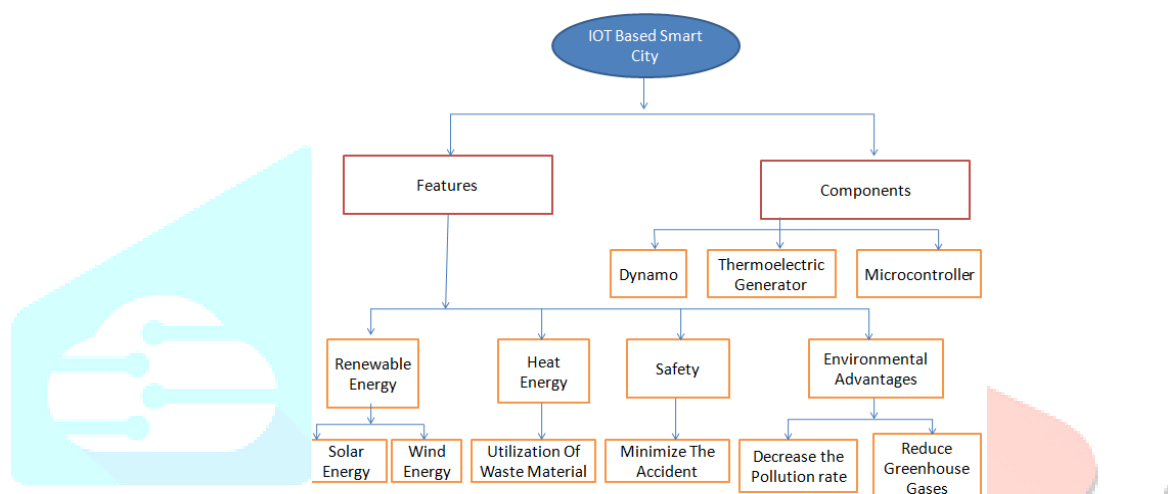
III. COMPLETE BLOCK DIAGRAM

Fig.3.1 block diagram

In above block diagram the main features of project are given in which use of renewable energy sources, safety devices, environmental advantages are to be considered. By use of hybrid power plant of solar and wind renewable energy source is considered, by using garbage monitoring device environmental advantaged is satisfied, RFID sensor is use for safety purpose of consumer and by using intelligent street lightning system we can save the electricity.

IV. CONCLUSION

Nowadays many cities face complex challenges to meet objectives regarding socio-economic development and quality of life. And concept of this project "IOT Based Smart Intelligent Lighting System for Smart City" is to respond these challenges. This project consists of the four ideas like garbage monitoring, hybrid power generation, U- turn system, street lightning. This has the several applications such as pollution free enviroment, continuity of the supply system; reduce the accidents, saving the energy. With help of this project we can save more percentage of energy than any other sources.

V. ACKNOWLEDGMENT

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