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EASY METERING OF ENERGY METER USING INTERNET OF THINGS PLATFORM

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ABSTRACT: In this paper, we use both renewable and nonrenewable energy sources for home appliances. Some limits are being set to make the home appliances consume both the renewable and nonrenewable energy sources daily. The units consumed by the home appliances from both renewable and nonrenewable energy sources are being uploaded to the EB section through Internet Of Things platform. The renewable energy used in this project is solar energy and wind energy. The advantage of using this project is, it reduces the carbon emission, controls global warming by reducing the use of nonrenewable energy obtained from the power grid supply. This project avoids the mistakes which occur while taking readings from the energy meter manually. It also helps the user to get updated of his power consumption from EB power and renewable energy with the help of IOT.

Key words: IOT, Renewable Energy, Nonrenewable Energy, Solar and Wind Energy.

1. INTRODUCTION

The power supplied to the homes, hospitals, industries, schools, etc. are obtained from thermal power plant, nuclear power plants and few more. The nonrenewable resources are used for obtaining this power. To obtain a single unit of power a huge amount of nonrenewable resources are consumed, which leads to depletion of resources and increases carbon emission to the environment. These carbon emissions will give rise to global warming, air pollution and depletion of ozone layer. In our project we are aiming to reduce the consumption of nonrenewable energy by consuming renewable energy. The renewable energy used here is solar and wind energy.

The power consumed by the home appliances are recorded by the EB meter in each house. The readings from the EB meter are taken manually by the EB officers and they will make cost calculations for the power consumed by each house. Many mistakes can occur while taking those readings or while doing calculations, etc. To avoid that we are directly updating the power consumed by the each house to the EB section through IOT (Internet Of Things).We update both the renewable and nonrenewable energy consumed by the user to EB section through IOT.

2. LITERATURE SUMMARY

[1]The author presents last meters smart grid on customer premises. ZigBee is used for transmitting information to the user based on their power consumption of their smart home appliances. [2] The author presents about an intelligent energy network working with all its connected devices. [3] The author presents detailed explanation of IOT applications and IOT as internet of objects.

3. PROPOSED SYSTEM

The proposed system uses embedded system to make the house hold

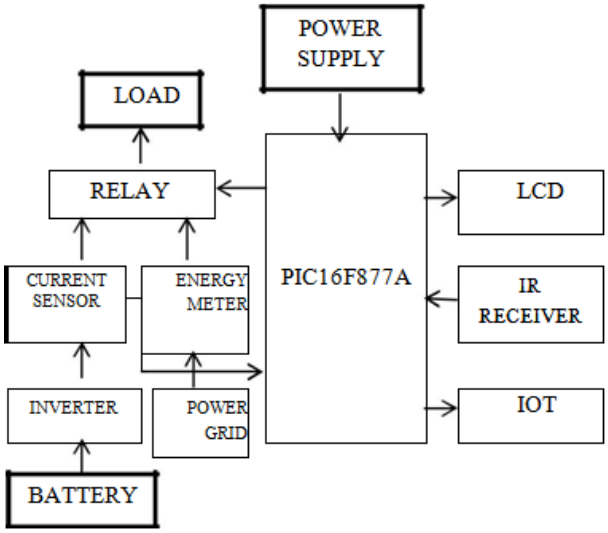

FIG.1 Block diagram of proposed system

Appliances to use both renewable and nonrenewable energy. The energy meter is embedded in an Internet Of Things platform. The PIC microcontroller (PIC16F877A) will make the relay to automatically switch the load to either renewable or nonrenewable sources. The renewable resources used are solar and wind energy.

The solar panel will produce more energy during day time from 9am to 4pm and during night time wind energy will be generated. Both these energy are stored in the battery with the help of relay. The relay here will connect the battery to any

one of the energy which generates more power. The power obtained from the battery is DC power .Inverter is used to convert the DC power to AC power. Current sensors are connected to battery to indicate the energy status of the battery. The output from the current sensor is connected to the analog ports of PIC microcontroller. If battery power is about to drain the microcontroller will automatically switch the load from renewable energy to nonrenewable energy (power grid supply). The power consumed by the load from the power grid supply is measured by using energy meter.

The energy meter has an inbuilt IR Transmitter in it. IR Transmitter is nothing but an LED. This LED will glow when one rotation is completed in the energy meter. Rotation speed depends upon the power consumed by the home appliances. When LED glows the IR Receiver will receive that signal and updates that value to the PIC microcontroller.

The PIC microcontroller will get the units consumed by the home appliances with the help of energy meter and the current sensor. By using UART the units consumed by the user is uploaded to the internet through IOT.

USART (Universal Synchronous Asynchronous Receiver and Transmitter) is used to transfer the units from PIC microcontroller to IOT. The IOT is nothing but an Internet Of Things .Using IOT communication between people to people, things to things, things to people takes place. IOT here works with the help of SIM (Subscriber Identity Module) which works based on GPRS system (General Packet Radio System).Through IOT the data's about the source usage and the units consumed by the user is automatically updated in the webpage at EB section. Each user is given a separate username and password. This helps the user to know how much amount of energy his home appliances as consumed from renewable and from non-renewable energy.

4. ADVANTAGES

The advantages of our proposed system are: The user can set a limit for their power consumption from nonrenewable energy (grid power). That limit is set in the microcontroller. If that limit is exceeded then the microcontroller will make the relay to trip the renewable energy as power source for the load.

Reduces the grid power consumption.
Accessible anywhere in the world.

5.RESULTS AND DISCUSSION

In this project we have used both renewable and nonrenewable energy as power source to the home appliances. The power consumed by the home appliances is automatically updated to the EB section through IOT without any manual interference. The updated data on the EB section webpage through IOT is shown below.

6. CONCLUSION

Thus the energy meter readings are automatically updated to EB section using IOT. Awareness is created to all people about the efficient use of renewable energy as a power source for all appliances. This will reduce the power consumption from power grid, which will reduce carbon emission to the environment. It saves the remaining nonrenewable resources from extension. IOT is the upcoming system which plays major roll in all the places. In future IOT can be used in more efficient ways to control any operations from anywhere in the world.

7. REFERENCES

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