International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (IJAREEIE)

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 6.392|

|| Volume 9, Issue 4, April 2020 ||

Auto Power Supply Control from Different Sources

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ABSTRACT: In this current situation, the demand for the electricity is increasing every day and frequent power cuts causing many problems in various areas like industries, hospitals and houses. An alternative of power arrangement is must. The main objective of this paper is to provide an uninterrupted power supply to a battery. In future, Electric vehicles will be the most emerging technologies so that there is a need of more number of batteries for EV, for that we are providing a charging station from any of the sources of solar, wind and mains automatically in absence of any of the sources. The main concept of this paper is to charge the EV Battery from the least carbon emission source. Based on the Location, The Sources will be activated automatically to charge the vehicle, So that we are making the auto power supply control system using PIC microcontroller 16F877A and electronic relays, converters and LCD Display.

KEYWORDS*:* PIC microcontroller 16F877A, Electronic relays, Auto power supply, LCD Display.

I.INTRODUCTION

The auto power supply control system is very convenient system for those consumers who want to attain uninterruptible power supply from different sources such as solar, main, wind mill. If we consider this at commercial level, we can estimate that there are so many consumers which have the machines whose requirements is only uninterruptable power supply. Such as the data base companies whose all work is done on computer then it is required an uninterruptable power supply all the time when the load is shifted on another source, similarly the companies having the data base production machines then it may be off during the load shifted then their production will be affected.

For those problems we will provide an auto power supply control system in this modern world. Different peoples and companies are power supply control system which are making this system with the help of magnetic contactors and power relays but their system is so much costly and do not provide precise uninterruptable power supply. Here we are developing the auto power supply control system with the help of PIC microcontroller 16F877A and electronic relays, converters and LCD Display

II.EXISTING AND PROPOSED SYSTEM

An important demand of electrical power distribution systems is that they want for automatic operation. In particular, the rapid and reliable transfer of the system from one power supply to a different throughout bound system events is vital to achieving the reliability goals for such systems and the facilities serves. In the existing system, they proposed four switches to indicate the failure of the power supply. By pressing anyone of the switch, absence of that particular source can be found out.

In this proposed system solar and windmill is used for generating power. Since solar and wind has various advantages than other energy sources. Based on the location, it will provide a power supply using the availability of the resources. It needs only lower cost.

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|| Volume 9, Issue 4, April 2020 ||

III. BLOCK DIAGRAM

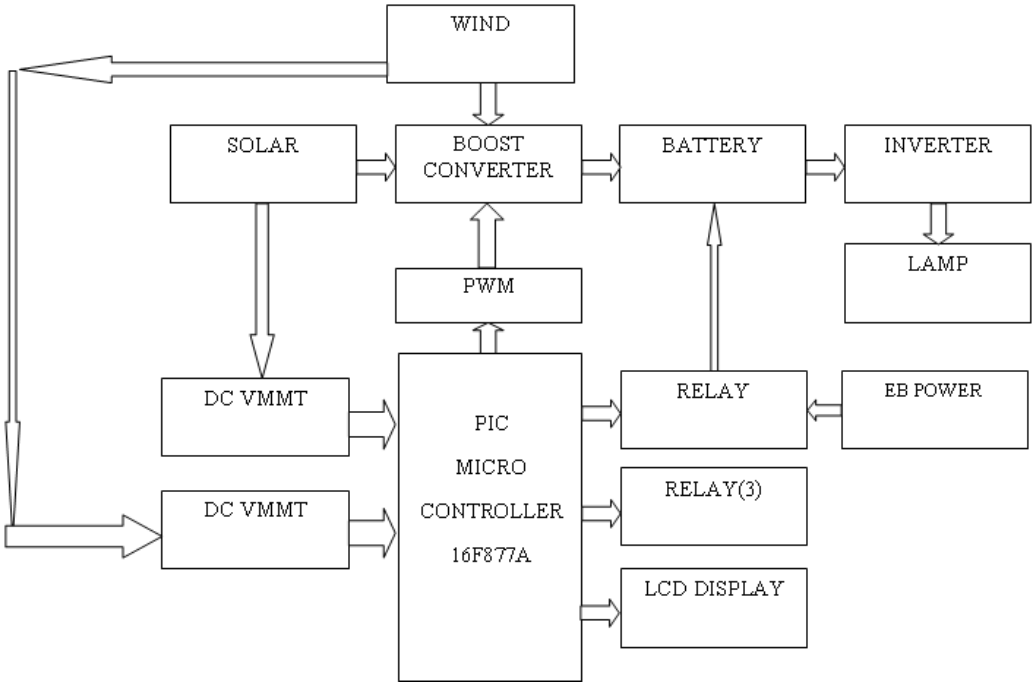

Fig 1: Block Diagram

Compared to coal and gas plants for power generation, the cost of wind power has dropped about 50% and also solar has dropped about 85% and also the pollution free environment. It does not produce any harmful gases to affect the environment .It has less maintenance .it has a greater Efficiency than other resources. Here Boost converter is used when the generation of power is not up to the required level to Charge the battery. From this auto power supply control system, we will attain the uninterruptable power supply to charge the battery using the availability of the sources based on the location. It leads to provide an efficient charging station for the Electric vehicles in future. And also these sources have the various advantages like cheaper than other sources; also having the high efficiency it draws continuous dc current from the Renewable energy.

IV. HARDWARE REQUIREMENTS

A. MICROCONTROLLER PIC16F877A:

Fig 2: Microcontroller PIC16F877A

In this auto power supply control system, PIC 16F877A microcontroller is used for selecting the source based on the availability. It automatically shifted the load to the other available power supply source and it is powered up with 5V dc voltages. Microcontroller is interfaced with LCD display and other driver circuits.

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B. CONVERTER:

A boost converter is a DC to DC converter with an output voltage greater than the source voltage. It steps up the source voltage. Since the power must be conserved, the output current is lower than the source current. It is also called step-up converter.

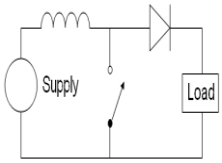

Fig 3: Converter

C. SOLAR PANEL:

Fig 3: Solar panel

Solar panels are used to convert the photons into electric power in order to charge the electric power loads, Compared to coal and gas plants for power generation, solar has dropped about 85% and also the pollution free environment.

D. WINDMILL:

Fig 5: Windmill

A Wind mill is a machine which converts the energy of wind into generating electricity, and also for the other purposes like pumping water and the cost of wind power has dropped about 50% than other sources.

E. RELAY:

Fig 6: Relay

Relays are electromechanical devices or solid state devices which operate in response to a signal which may voltage, current, temperature etc. Electromagnetic relays operate due to magnetic fields.

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F. LCD DISPLAY:

Fig 7: LCD Display

LCD display is used for displaying the source of supply on which the system is working.

G. BATTERY:

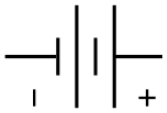

Fig 8: Battery

A battery is a device consisting of one or more electrochemical cells with external connections for powering electrical devices. When a battery is supplying electric power, its positive terminal is the cathode and its negative terminal is the anode.

H. INVERTER

I. CFL LAMP

V.SOFTWATE TOOLS

A. MP LAB:

MPLAB IDE is an integrated development environment and it helps to develop and debug firmware for various Microchip devices. It is a Integrated Development Environment for the Microchip Technology and

Incorporated with PIC microcontroller (MCU) and dsPIC digital signal controller (DSC) families.

It consist of,

i. MPLAB SIMULATOR

ii. IC PROG

iii. COMPILER-HIGH TECH C

iv. PIC START PLUS PROGRAMMER

B. PCB DESIGNING:

Design and fabrication of Printed circuit boards. Printed circuit boards form the core of electronic equipment in domestic and industrial. it is mainly used for computers, process control, telecommunications and instrumentation.

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i. MANUFACTURING

ii. SOFTWARE

- ✓ MICROSIM.

iii. PANELISATION

iv. DRILLING

v. PLATING

vi. ETCHING

vii. SOLDERMASK

viii. HOT AIR LEVELLING

VI.WORKING METHODOLOGY

The voltage value of 7V is kept as base value. When voltage is minimum than 7V the boost convertor come into action which boost the voltage to the value of 15V. When the voltage rises over 15V the buck convertors come into action which reduces the voltage into a voltage of 15V. Thus the voltage of 15V is used to charge the battery, this comes from the sources of solar and wind. This battery is connected to invertors which convert the dc charge into ac charge which is given to load. The load used here is CFL bulb. Based on the availability, it will automatically Charge the battery using the availability of the sources.

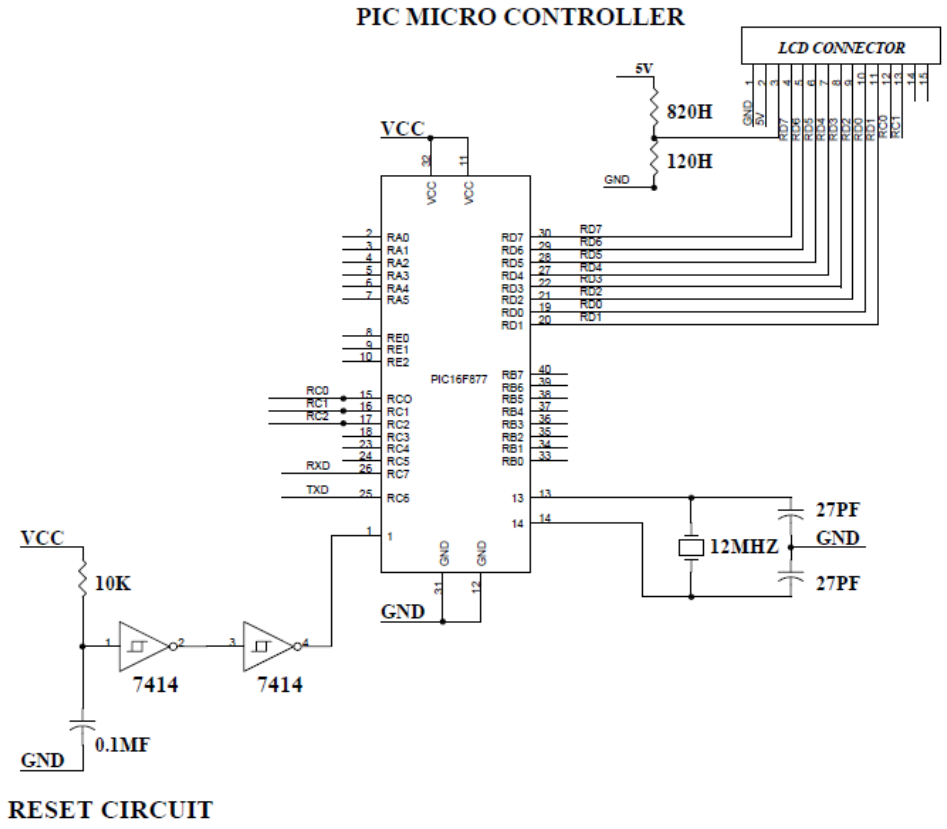

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Fig 9: LCD WITH PIC MICROCONTROLLER

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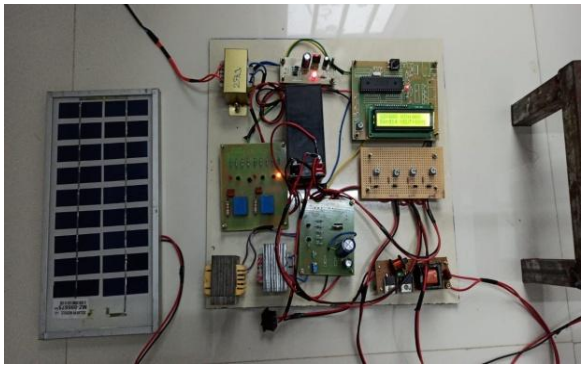
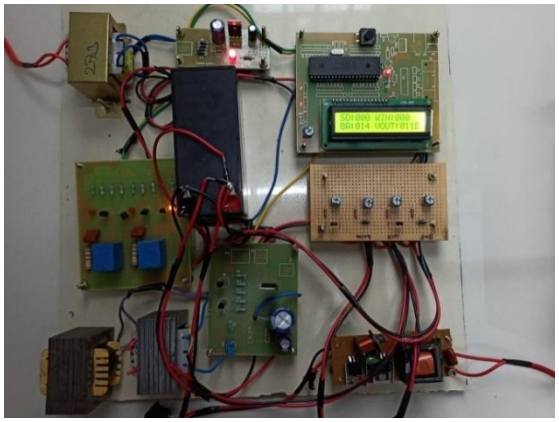
VII. RESULTS AND DISCUSSION

A. In this project ,we assume that 7v act as a base value, when the level of voltage from the sources like solar and wind is under 7v then it raises up to 15v using boost converter, also when it exceeds 15v then it is reduced to 15v using buck converter here 15v is used to charge the battery.





B. Incase, when both sources has failed to give the voltage, it automatically charge the batteries using EB main supply.

Fig 10: Working of LCD with Microcontroller

From this auto power supply control system, we will attain the uninterruptable power supply to charge the battery using the availability of the sources based on the location. It leads to provide an efficient charging station for the Electric vehicles in future. And also these sources have the various advantages like cheaper than other sources; also having the high efficiency it draws continuous dc current from the Renewable energy. It has features of lower capacitor voltage rating, and It Reduces the switching for Renewable energy and inverter.

VIII. CONCLUSION

In this paper, the auto power supply control system not only gives uninterrupted supply to the battery of EV. It also have the various advantages for using these resources like windmill generating systems, Flexible alternative current transmission systems, High voltage transmission systems, Battery storage systems, Electric motor, Renewable energy sources. Compared to coal and gas plants for power generation, the cost of wind power has dropped about 50% and also solar has dropped about 85% and also the pollution free environment. It does not produce any harmful gases to affect the environment.

IX. FUTURE SCOPE

In future Electric vehicles will be one of the most emerging technologies and the demand of batteries will be increasing so We proposed the idea that using these Auto power supply control system from different sources ,It leads to developing the charging stations in order to charge the batteries of electric vehicles in a efficient manner.

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