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Energy Production with Multiple Sources and Line Selection with Jumping Priority for Power Distribution Return Feeding Line.

KhataVira [1], Patel Ravi [2], KureshiParvez [3],Mr Deep P Thanki[4]

[1]B.E student, Electrical Engineering, Sigma Institute of Engineering, Vadodara
[2]B.E student, Electrical Engineering, Sigma Institute of Engineering, Vadodara
[3]B.E student, Electrical Engineering, Sigma Institute of Engineering, Vadodara
[4] Lecturer, Electrical Engineering Sigma Institute of Engineering Vadodara

Abstract- *This Project is an attempt for improving the power distribution capacity in rural areas by developing an off grid portable backup or return power feeding which uses various forms of renewable energy.The various forms of energy used in this project are solar, wind, grid, battery and DG with their availability and priority . With the advancements in power, now it is able to harvest energy from sources which are impossible to harvest using traditional energy conversion methods. In this project, a proposed line and micro controller for the power management was designed, and then tested. Results show the functionality of the proposed method of jumping priority with automatic line selection in various condition. Further improvement of design also be described.*

Keywords-*8051Microcontroller[t],Microgrid, 7805 voltage regulator IC, Rectifier, Kiel v7,Protius*

I. INTRODUCTION

The Micro-grid is concept about the energy production with the help of multiple source and line selection for distribution system with return feeding line hence we increase the efficiency of generation and distribution of electricity. The power distribution capacity in rural areas by developing an off grid portable backup or return power feeding which uses various forms of renewable energy. The various forms of energy used in this project are solar, wind, grid , battery and DG with their availability and priority.In addition, power providers (i.e., electric utilities) in most states allow net metering, an arrangement where the excess electricity generated by grid-connected renewable energy systems "turns back" your electricity meter as it is fed back into the grid. If you use more electricity than your system feeds into the grid during a given month, you pay your power provider only for the difference between what you used and what you produced

II. BLOCK DIAGRAM

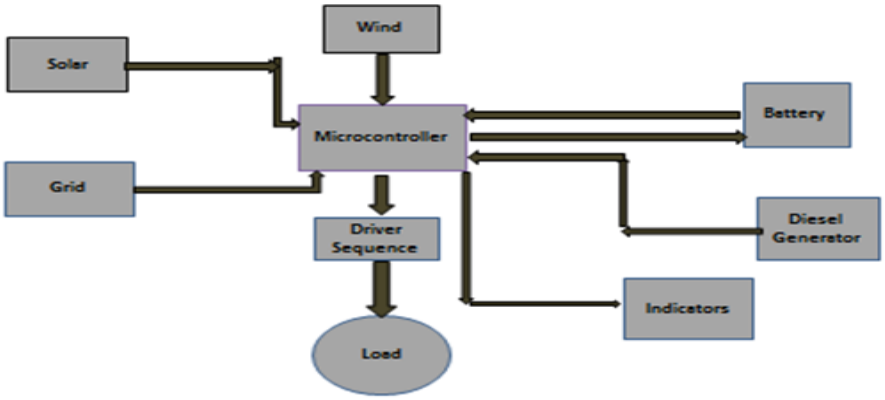

Figure.1 Block Diagram

Several renewable sources have been through a good development in the last decades. Therefore, their combination would apparently provide a good un interruptible power system. Different renewable generators would complement each other. However, a lot of requirements have to be considered first. It is important to understandall the factors that influence its behavior, in order to get the best of it. The most important factors are

location, time and user needs (power). Location associates informationabout climate, energy sources availability and environment conditions. This information is very important to decide what kind of renewable generators can be chosen. The development of hybrid power system suited for remote locations. Hybrid power systems are designed for the generation and use of electrical power. They are independent of a large, centralized electricity grid and incorporate more than one type of power source. They may range in size from relatively large island grids to individual household power supplies. In general a hybrid system might contain alternating current (AC) diesel generators, an AC distribution system, a DC distribution system, loads, renewable power sources, energy storage, power converters, rotary converters, coupled diesel system.

III.CIRCUIT CONNECTION OF MICROGRID

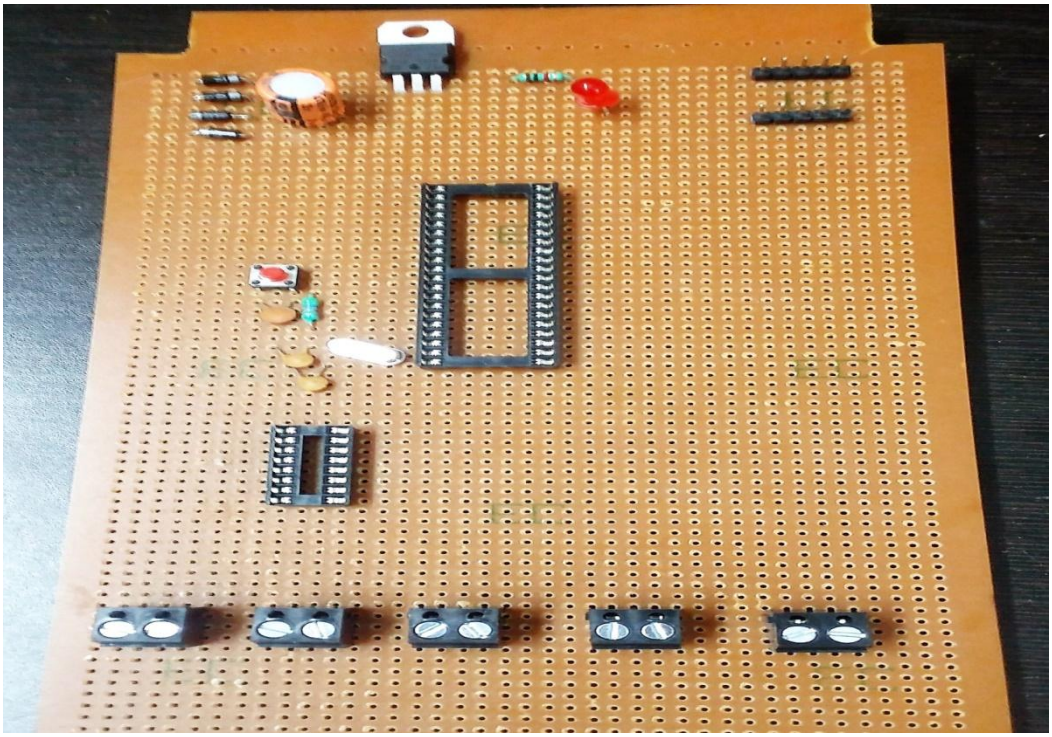

Figure. 2 Circuit of Microgrid

The step down voltage from 230/12V is goes to the bridge rectifier. In bridge rectifier there is smoothing Capacitor is connected hence it work as a filter. There is one 7805 voltage Regulated IC is connected across it. The 7805 voltage Regulator IC is used to convert the voltage in 5V. The voltage from the voltage regulator is 5V which is used for Microcontroller VCC. In Microcontroller there is 40 PIN, out of this pin no.18&19 Crystal is connected.The crystal is used to maintain the oscillation in the circuit.

IV. BRIDGE RECTIFIER CONFIGURSTION

In Bridge Rectifier there four diodes are used and one Capacitor is used. The Capacitor is used for filtering voltage.

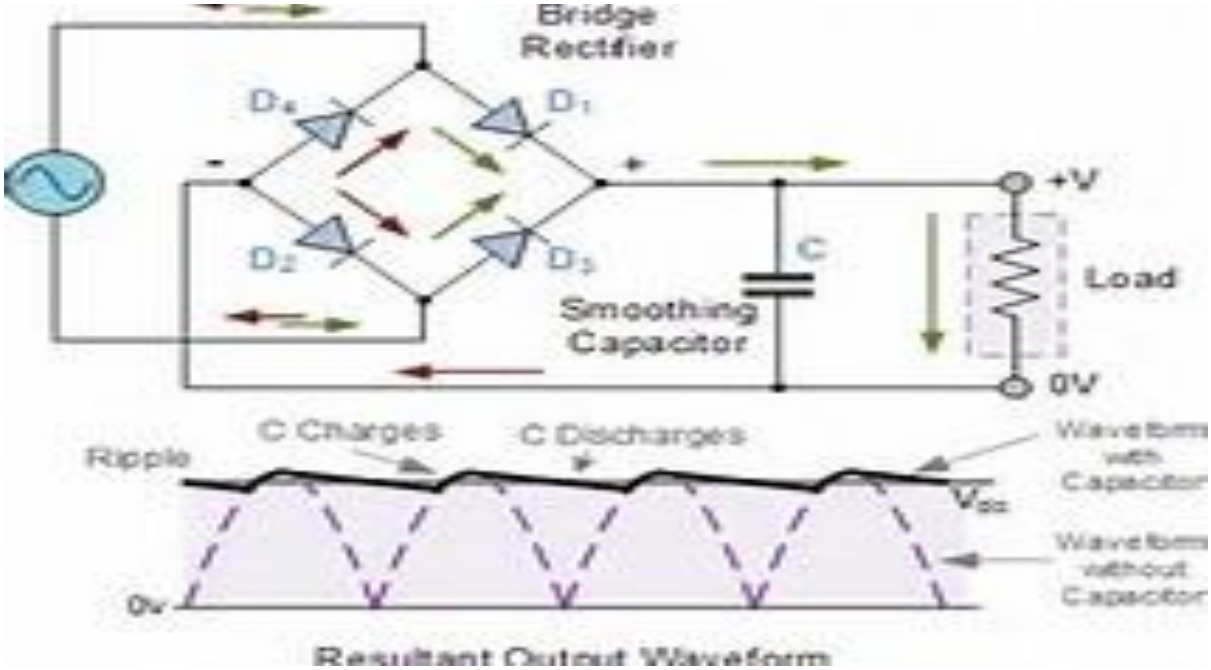

Figure 3. Bridge rectifier configuration

IV. 7805 VOLTAGE REGULATOR IC

7805 is a voltage regulator integrated circuit. It is a member of 78xx series of fixed linear voltage regulator IC. The voltage source in a circuit may have fluctuations and would not give the fix voltage output. The voltage regulator IC maintains the output voltage at constant value. 7805 provides +5V regulated power supply.

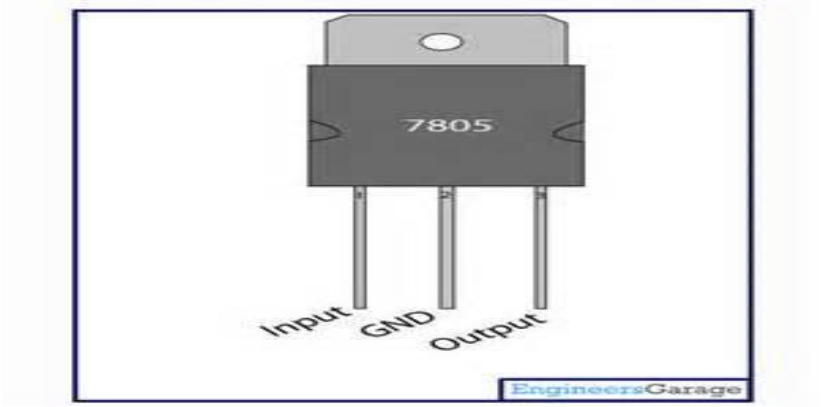

Figure 4.7805 voltage regulator IC

V. CIRCUIT DIAGRAM

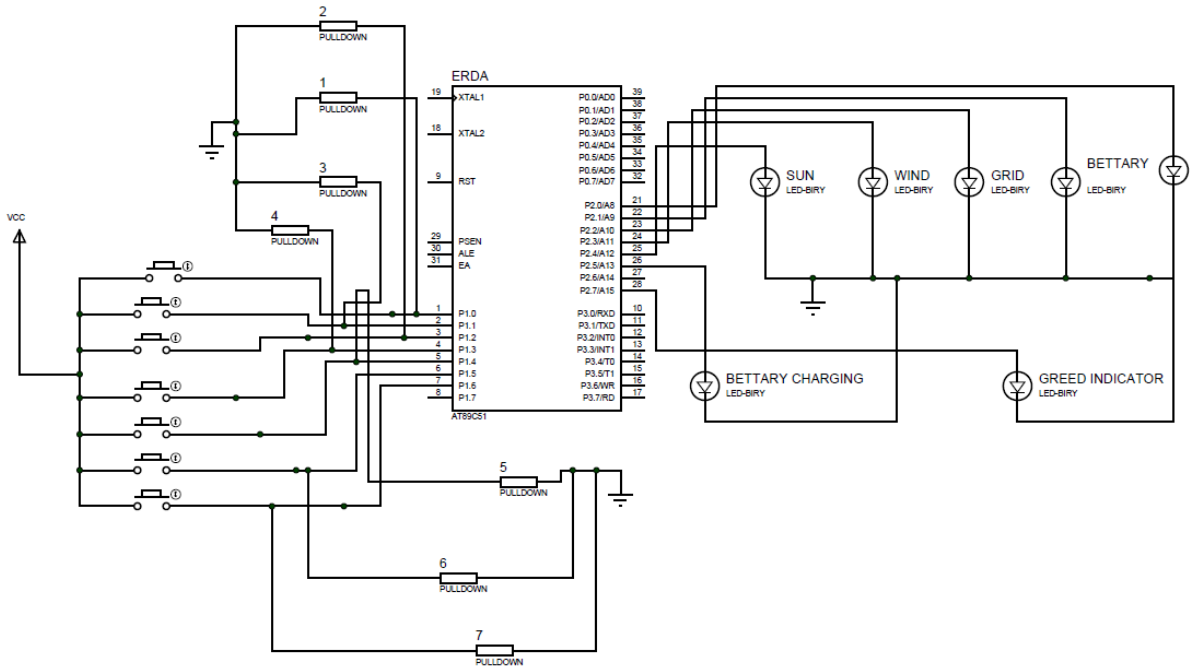

Figure5.Circuit diagram

VI. WORKING

In this there are various sources are used in this system like sun wind grid ,diesel generator etc.The system working on the base availability and priority of sources, if the sun is fills the priority we can use the sun as generation source ,if the sun is not available during cloudy season this time we have to give the priority for other Implimation source like wind, grid. The grid connection is available but some remote areas where electricity is not reach continuously hence the continuity is not maintained .In this system indicators are shows the which source priority is available. In this systemswe implement the battery back- up. The battery back- up is used for the stored power we can return feed where the electricity is demanded. In this system we have implement the diesel generatorwhich is optional source, it use when the system get shut down or used sources priority is not available. This system is called hybrid or micro-grid. The system is maintained and controlled by 8051Microcontroller.

VII. HARDWARE IMPLIMENTATION

7.1 List of Components Used For This Project

- Transformer
- Diode
- Microcontroller
- 7805 voltage regulator IC
- Capacitor
- Resistor
- Relay
- PCB
- LED
- ON OFF Switch

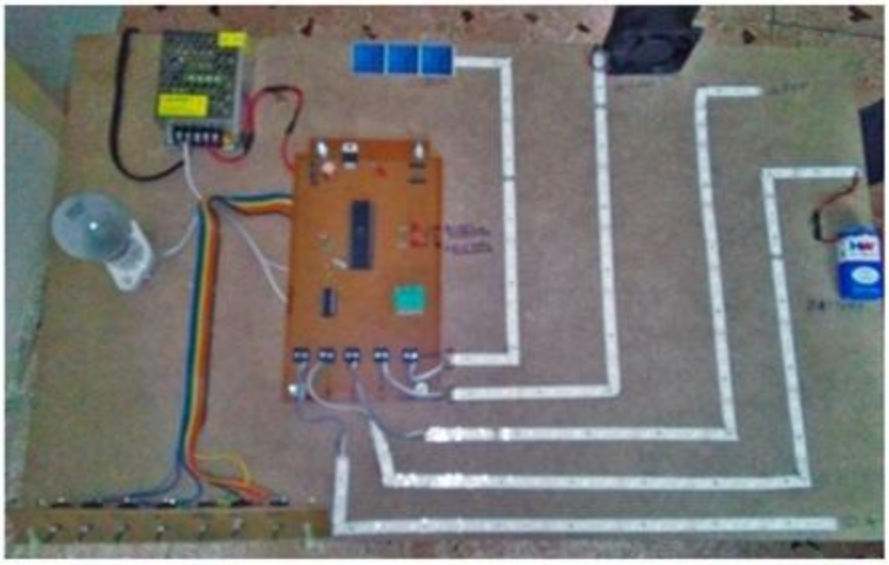

Figure 6. Hardware model

VIII.CONCLUSION

In this project we designed the hardware base model in such way that if the power is cut off or not reachable in remote areas where attempt to improving the power distribution capacity in rural areas by developing an off grid portable backup or return power feeding which uses various forms of renewable energy. The various forms of energy used in this project are solar, wind, grid, battery and DG with their availability and priority.

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