

# **FINAL YEAR PROJECT REPORT**

## **Integration of Solar, Wind, Biogas Generation**

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# **Integration of Solar, Wind, Biogas Generation**

Project Report submitted to the  
Department of Electrical Engineering, University of Management and  
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in partial fulfillment of the requirements for the degree of  
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## **Abstract**

In this era of energy crisis and environment conscious, everyone is well aware of the importance and necessity of research and development in the field of renewable energy sources. It is more important when conventional energy sources are fastly depleted and energy demand in world particularly in developing countries is increasing exponentially with technological development. Among all renewable sources the solar , wind and bio energy which is in abundance and pollution free, widely distributed, freely available and covering wide range of application is becoming more popular so we develop a solar, wind and bio integration system with efficient power management.

In this project we improve the efficiency of solar, wind bio system by integrating them for maximum utilization of energy. We design a system to store energy in batteries and to get direct power in Ac and Dc source. Our system is microcontroller based system which automatically switches power to battery or to load depending on the voltage of the source. Major components LCD, Inverters, DC generator, Relay, Transistors.

## **Dedication**

We want to dedicate our Project to our Parents. We want to say thanks for their unconditional Support with our studies. We are honored to have them as our Parents. Thanks for giving us a chance to prove and improve our self through all our walks of life.

## **Acknowledgements**

All praises to **Allah**, the source of all knowledge, wisdom within and beyond our comprehension. In fact, we cannot repay even a single blessing conferred upon us by **Allah**. So first of all we offer our thanks to **Almighty Allah**, who gave us courage and interest to complete our project, and without whose help and we will, it was not possible for us to finish it.

We pay our sincere gratitude to our kind parents whose love affection and priceless prayers for us, let us do to our work with devotion, which finally let us complete project.

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**CHAPTER: 1**  
**INTRODUCTION**

## **Introduction**

Electricity causes pollution in many ways, some worse than others. In most cases, fossil fuels are burned to create electricity. Fossil fuels are made of dead plants and animals. Some examples of fossil fuels are oil and petroleum. Many pollutants (chemicals that pollute the air, water, and land) are sent into the air when fossil fuels are burned. Some of these chemicals are called greenhouse gasses.

As a responsible world citizen, start looking for alternate energy solutions like solar energy and wind energy. Employing these alternate power solutions is extremely feasible and cost-effective. You will not only cut down your power bills but also contribute to a better future of the world.

Main advantage of solar energy and wind energy is that these are from nature and will never end till judgment day. These sources will not cause any pollution or global warming so there is no disadvantage of using wind and solar for electricity. Electricity produced by these sources will be endless and we will not have to worry about energy crisis especially in Pakistan where we are facing a serious energy crisis.

### **Our project comprises**

- Solar panel
- Wind mill
- Biogas
- Charge controller
- Inverter
- Battery

### **1.1 Aim of the project**

The world is gradually marching towards a severe energy crisis, what with an ever-increasing demand of energy overstepping its supply. We have always known that the energy we use every day is not unlimited, yet we take it for granted. Oil, gas, power, even water has limited availability. Yet, we have not taken enough

precautions to deal with a possible energy crisis. When I say 'we', I am not referring to the governments but to all of us, the common people. Oil and gas have already become too expensive, and with each passing day, they are moving towards being extinct. Prices have been rapidly increasing for the last five years, thanks to the ever-increasing demand and the increasing shortage of energy resources.

Energy crises is a big issue today in whole world as well as in Pakistan

Short fall of electrical energy is a big hindrance to the development of Pakistan

Despite of lot of energy sources we are facing load shedding up to 14 hrs.

Industry is declining day by day. Dearness is increasing at a rapid rate.

The word reliability is not found in our power system. So only solution to our problems is

- 1) Generation of electrical energy from renewable sources like solar energy, Wind And Biogas
- 2) Power system management by proper use of available sources

These were the reason which urged us to work in this dimension.

Then we worked and found solar and wind energy the most suitable one in countries like Pakistan. This argument will be justified in coming pages.

### **1.1.1 Need Of Renewable Energy Sources:**

Renewable energy is energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished). In this era of energy crisis an environmental conscious, everyone is very well aware of the importance and necessity of research and development in the field of renewable energy sources. It is more important when conventional energy sources are being fastly depleted and the energy demand in the world particularly is increasing exponentially with the technological development. Climate change concerns, coupled with high oil prices, peak oil, and increasing government support, are driving increasing renewable energy legislation, incentives and commercialization.