

# Hybrid Wind and Solar Power Generation

Usman Iqbal Shaikh Redkar<sup>1</sup>, Mohd. Aman Faizan Yousuf<sup>2</sup>, Mohd Shoeb Younus<sup>3</sup>

<sup>1, 2, 3</sup> Dept of Electrical Engineering

<sup>1, 2, 3</sup> KJ College of engineering and management research

**Abstract-** Autonomous operation of a microgrid system hinges on the efficient combination of various energy resources to maintain self-sustainability of energy supply. Furthermore, it is equally important to coordinate the resources to regulate the microgrid voltage profile. The problem becomes more complicated if these resources have intermittent characteristics such as solar PV and wind turbines. This paper presents a hybrid solar PV/Wind turbine system for voltage regulation in a microgrid. Demand response (DR) is employed to control the total energy consumption, so as to maintain the system security and enhance the microgrid's voltage profile. The singular use of solar PV and wind generation is tested and compared to the coordinated hybrid case. Investigation is carried out on an autonomous microgrid bus feeder to validate the effectiveness of the proposed system. It is seen that the coordination between the two variable renewable energy resources is much more effective in regulating the voltage throughout the microgrid.

**Keywords-** Hybrid Energy; Solar Energy; Wind Energy; Clean Energy; Electrical Energy Generation.

## I. INTRODUCTION

If any expression were to be used to relate the time in which we are living, it would be “renewable energy.” For decades now, this term has caused many line of work to design and manufacture products in efforts of promoting this phrase. The cost and ease of transportation, however, is the biggest problem these companies are facing. For the past few years, new corporation have been developing small power systems that can be used in locations where there is no electricity or in locations that suffer constant power outages. Different from a generator which is too heavy, too loud and requires fuel these companies are focusing on small hybrid systems that use only the sun and the wind to generate electricity. Unlike a generator, a hybrid system uses clean energy, runs quietly and can be easily transported when compared to standard systems.

## II. PROBLEM STATEMENT

Hybrid energy system is the combination of two energy sources for giving power to the load. In other word it can defined as “Energy system which is counterfeit or

designed to extract power by using two energy sources is called as the hybrid energy system.” Hybrid energy system has good reliability, efficiency, less emission, and lower cost. In this proposed system solar and wind power is used for generating power. Solar and wind has good advantages than other than any other non-conventional energy sources. Both the energy sources have greater availability in all areas. It needs lower cost. There is no need to find special location to install this system.

## III. LITERATURE REVIEW

As the world becomes more concerned about its environment, pollution and energy, countries are beginning to switch to renewable energies. Energy is essential to us to ensure our quality of life but the increasing cost of energy and environmental concerns are necessary to look for alternative sources. We will evaluate two systems, solar panel systems and solar and wind hybrid system (our system). A small solar panel system can be a reliable and pollution-free producer of electricity for a home or office and is cost-effective. Several companies offer these off the shelf such as Tata power solar system located in Bangalore provides innovative solar products. These products are affordable and use both direct and scattered sunlight to create electricity to the home. However, the amount of power generated by this system depends on how much of the sun's energy reaches it. Thus, it works best in the western India and northwest India, which receives the greatest amount of solar energy. Hybrid power systems, which use solar and wind are an increasingly preferred alternatives for several reasons. In much of the india, wind speeds are low in the summer when the sun shines brightest and longest. The wind is strong in the winter and rainy season when less sunlight is available. Because the peak operating times for wind and solar systems occur at different times of the day and year, hybrid systems are more likely to produce power when you need it.

## IV. PROPOSED WORK

Solar-Wind hybrid Power system is combined power generating system by wind mill and solar energy panel. It also includes a battery which is used to store the energy generated from both the sources. Using this system power generation by windmill when wind source is available and generation from

PV module when light radiation is available can be achieved. Both units can be generated power when both sources are available.



## V. FUTURE SCOPE

The main purpose of research in wind-solar hybrid system is to:

1. Decrease the cost of power generated by the wind.
2. To create a stand-alone energy source that is both dependable and consistent.
3. Enhance the efficiency of wind power output.
4. Increase the reliability and predictability of the energy source.
5. Investigate and reduce the adverse environmental impact of massive deployment of wind turbines.
6. Other wind extension concept must be promoted.

## VI. CONCLUSION

Hybrid power generation system is good and effective solution for power generation than conventional energy resources. It has greater efficiency. It can provide to remote places where government is unable to reach. So that the power can be utilize where it generated so that it will reduce the transmission losses and cost. Cost reduction can be done by increasing the production of the equipment. People should motivate to use the non conventional energy resources. It is highly safe for the environment as it doesn't produce any emission and harmful waste product like conventional energy resources.

## REFERENCES

- [1] Ashish S. Ingole, Prof Bhushan Rakhonde. "Hybrid Power Generation System Using Wind and Solar Energy".
- [2] Arjun A. K., Athul S., Mohamed Ayub, Neethu Ramesh, and Anith Krishnan, "Micro-Hybrid Power Systems A Feasibility Study", Journal of Clean Energy Technologies, Vol. 1, No. 1, January 2013, pp27-32.
- [3] N.Sivaramakrishna & Ch.Kasi Ramakrishna Reddy, "Hybrid Power Generation through combined solar Wind power and modified solar panel" International Journal of Engineering Trends and Technology (IJETT) Volume4 Issue5- May 2013, pp1414-1417.
- [4] [http://en.wikipedia.org/wiki/solar\\_power](http://en.wikipedia.org/wiki/solar_power).