RER Based Hybrid Technology for power Generation System: Pollution Free from GHG

Santosh Kumar Suman[*1], Aishvarya Narain[2] and Swati Maurya[3]

1.* Department of Electrical Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur, (U.P.), India. e-mail : sksumanee@gmail.com
2. Department of Electrical Engineering, Madan Mohan Malaviya University of Technology, Gorakhpur, (U.P.), India. e-mail : aishvarya.n89@gmail.com
3. Department of Electrical Engineering, Rajkiya Engineering College, Kannauj, (U.P.), India. e-mail : swatimaurya1990@gmail.com

Publication Info

Article history :

Received : 22nd Aug., 2018

Accepted : 22nd Nov., 2018

DOI : 10.18090/samriddhi.v10i02.1

Keywords :

Greenhouse gas (GHG), Renewable energy resources (RER),Hybrid Technology

***Corresponding author :**

Santosh Kumar Suman

e-mail : sksumanee@gmail.com

Abstract

This paper is presented to observe the conversion of renewable strength resources (RER) into electric power in a standalone hybrid electricity generation system. Recent electricity generation scenarios all over the world are not eco-friendly because the generation systems are by and large depending on fossil fuels that produce greenhouse gasoline (GHG) which contributes to worldwide warming. In this, the aggregate of two electricity resources is taking location i.e. Wind and solar energy. Solar panels are used for converting solar power and wind generators are used for converting wind power into strength. This electrical electricity era can function for numerous purposes. Generation of strength will take place at an affordable cost. This paper provides the Renewable Energy Based Hybrid Technology for Power technology that extracts the renewable energies in Sun and Wind to generate power. System manage relies particularly at the microcontroller. It ensures the optimal utilization of assets and consequently improves the efficiency as related to their person mode of the technology system. Also, it will increase the reliability and decreases the dependence on one unmarried source. This hybrid solar-wind energy generating machine is appropriate for industries and additionally for home areas with reasonable price without unfavorable the natural stability like Pollution Free from GHG.

1. INTRODUCTION

Power is maximum required for our normal lifestyles. There are one of a kind methods of energy age either through conventional strength resources or by non-everyday power sources. Electrical energy request increments in word so to meet request we want to create electric electricity. Presently multi day's electric energy is created with the aid of the standard power sources similar coal, atomic and diesel, etc. The primary drawback of those resources is that it yieldsdissipate like residue in coal control plant, atomic unwanted in atomic strength plant and coping through this consumption is costly. Furthermore, it likewise harms he nature. The atomic waste is extremely hurtful to individual moreover. The regular power sources are draining step by step. Before long it will likely be definitely vanishes from the earth so we need to discover another method to create electricity. The new source need to be reliable, infection free and prudent. The non-ordinary power assets need to be brilliant optional strength assets for the conventional strength resources. There are numerous non-everyday energy resources like geothermal, tidal, wind; sun based and so on the tidal strength has disadvantages like it is able to

just actualize on ocean beaches. While geothermal power desires especially ale challenge to split warmth from earth. Sun based and wind are correctly accessible in all condition. The non-ordinary power sources like sun powered, wind can be precise alternative supply. Sun powered energy has Disadvantage that it couldn't deliver electric electricity in blustery and overcast season so we ought to defeat this Downside we can make use of energy belongings with the goal that any of source falls flat different source will keep producing the electricity. Also, in terrific weather circumstance we will make use of the two resources be a part of. Whatever stays of the paper is looked after out as pursues. Segment-2 Represents Renewable Energy Based Hybrid Technology. Approach is given in Section-3. Re-enactment fashions are given in Section-4 and consequences are evaluated in Section-5. At final, ends are attracted Section-6.

2. RENEWABLE ENERGY BASED HYBRID TECHNOLOGY

Hybrid Technology device is the combo of two electricity energy for giving ability to the heap. In other phrase it could characterised as "Energy device which is imagined (manufactured) or supposed to split energy by means of using power assets is known as the half of and 1/2 Technology system." Hybrid Technology implement has notable unwavering quality, skill ability, less discharge, convey down price and unfastened from contamination. This paper famous the Renewable Energy Based Hybrid Technology for Power age that extricates the sustainable power resources in Sun and Wind to supply strength.

In this proposed system is the consolidated power producing system by sunlight based photovoltaic modules and wind turbines control is consumed for generating power. Solar based and wind has excessive favourable situations than other than some other non-regular energy sources. Both the energy sources have better availability in all regions. It essentials bring down expense. There is no compelling reason to discover exceptional area to introduce this system.

Solar-Wind hybrid power system is the joined power producing system by sun oriented photovoltaic modules and wind turbines. Utilizing this system, control age by the turbines when wind source is accessible and age from PV module when daylight is accessible can be accomplished. The two units can create control when the two sources are accessible. Fig. 1 demonstrates the schematic of the sun based breeze cross breed system to be displayed. The power produced from the PV modules system is of DC voltage which is changed over through a DC-AC inverter. The yield of the inverter is joined with the yield from the wind turbines and ventured up by a transformer which is associated with the matrix. In times when there is an abundance energy generation from the system, the transformer will bolster the overabundance created energy to the lattice, and when the system does not deliver enough energy to take care of the demand, the deficiency is nourished by the matrix to the transformer. Energy from the transformer is then provided to the heap, for our situation Gwanda area.

2.1 Solar Energy Scheme

Sunlight primarily based energy in India is a quick growing industry and starting at 31 December 2016, the nation's solar orientated lattice had a combined limit of 9,012.66 megawatts (MW) or nine.01 gigawatts (GW), [1]. In January 2015, the Indian government prolonged its solar primarily based plans, specializing in US$100 billion of venture and one hundred GW of sun oriented restrict, including forty GW's specially from housetop sun oriented, by means of 2022.[2] The fast development in sending of solar based totally electricity is recorded and refreshed month

S-JPSET : Vol. 10, Issue 2, ISSN : 2229-7111 (Print) and ISSN : 2454-5767 (Online)

to month at the Indian Government's Ministry of New and Renewable Energy web site. Huge scale daylight primarily based power association began simply as of past due as 2010, yet the goal-orientated targets might see India introducing extra than twofold that executed through world pioneers China or Germany in most people of the period as much as 2015 year cease.

Power within the night and in the cloudy season so we want to triumph over this drawback we will use each wind and solar together so that any individual of source fails every other supply will maintain generating the electricity [3-7]. And in accurate weather situation, we are able to use both resources combined. This paper affords analyses of MATLAB based totally grid-related hybrid PV/ wind power machine. The created model for PV depends on incremental conductance with basic controller calculation which gives greatest conceivable power from sun based PV cluster. The converter is shifting obligation cycle because of which converter change the PV voltage such a way, to the point that work the PV exhibit towards its greatest power point [4].

2.2 Wind EnergyScheme

The improvement of wind control in India started in the 1986 with first wind ranches being set up in seaside zones of Maharashtra (Ratnagiri), Gujarat (Okha) and Tamil Nadu (Tuticorin) with 55 kW Vestas wind turbines. These exhibit ventures were bolstered by the Minstry of New and Renewable Energy (MNRE). The limit has altogether expanded over the most recent couple of years and starting at 31 Aug 2016 the introduced limit of wind control in India was 27,676.55 MW, fundamentally spread over the South, West and North areas. In spite of the fact that a relative newcomer to the wind business, contrasted and nations, for example, Denmark or the United States, by year end 2015 India had the fourth biggest introduced wind control limit on the planet. (Behind 1. China, 2. USA and 3. Germany), having overwhelmed 5. Spain in 2015 and in front of 6. UK [6].

3. METHODOLOGY

Wind energy is the energy which is extricated from wind. For extraction we utilize wind process. Ii is sustainable power sources. The wind energy needs less expense for age of power. Upkeep cost is additionally less for wind energysystem. Wind energy is available very nearly 24 hours of the day. It has less outflow. Beginning expense is additionally less of the system.

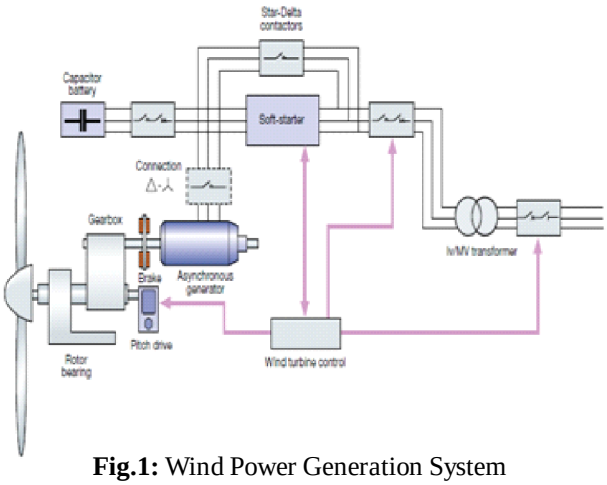

Fig.1: Wind Power Generation System

The significant impediments of utilizing autonomous sustainable power source assets are that inaccessibility of intensity forever. For beating this we utilize sunlight based and wind vitality together. With the goal that any one wellspring of intensity fizzles other will deal with the age. In this plannedsystem we can utilize the two sources joined. Another way is that we can utilize any one source and haveadditional source as a reserve the unit. This will reminders congruity of age. This will make the system dependable. The fundamental detriments of this system are that it needs a high beginning expense. Then again, actually it is dependable, it has less emanation. Keeps up expense is less.

The life expectancy of this system is more. Effectiveness is more. Nonconventional source as like wind energy, that energy change the form of power into electric energy. In this a cabin under turbine section is to the electric generator converts the machine-driven power into the electric power. The WT systems are existing oscillating starting 50W to 2-3 MW.

4. SIMULATION MODELSET

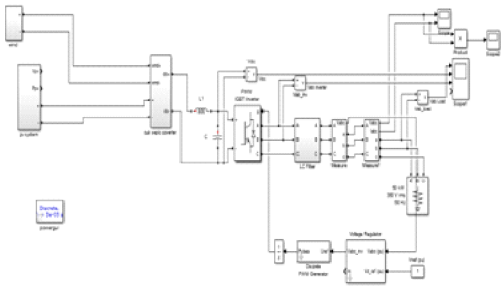

Fig.2: PV Model

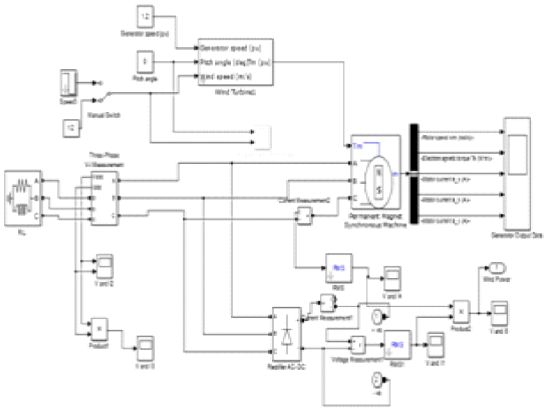

Fig.3: Wind Model

5. RESULTS

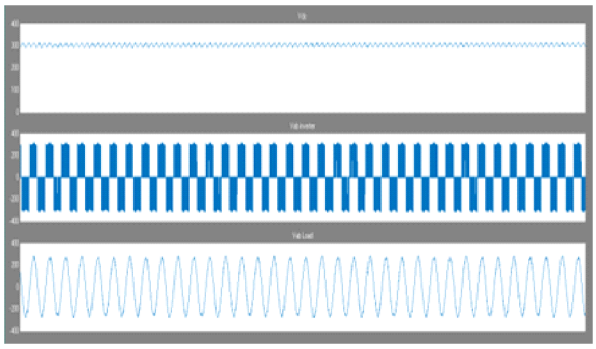

Fig.4: The output of inverter input and output waveform and filter output waveform

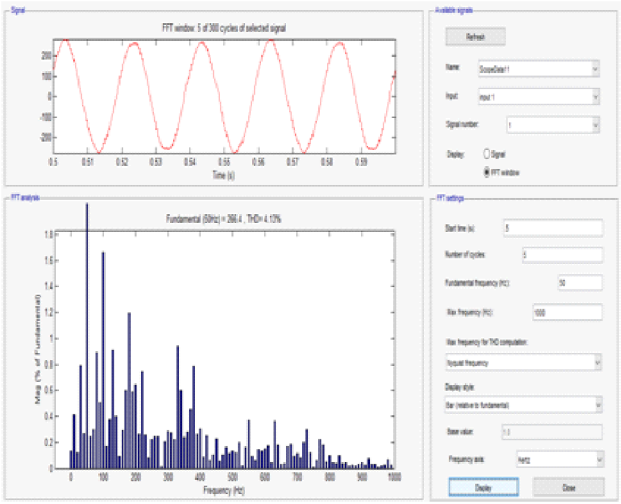

Fig.5: THD of the Output Voltage.

6. CONCLUSION

In this paper, a sustainable and environment friendly Renewable Energy Based Hybrid Technology for power Generation System which is free from Pollutions. Renewable energy resource technologies are one of the fastestlatest growing technologies in theall country. It is able to provide to foreign places wherein the authorities is not able to reach. In order that the strength may be applied where it generated so that it will lessen the transmission fatalities and price. Ordinary it's miles smarter and really green way for pollutants-free electricity generation.

REFERENCES

[1] Jain, A., Srinivas, E., Raman, S., Gaddam, R. R., Haritha, V. V. S. S., and Srinath, N. V. 2010. Sustainable energy plan for an Indian village. In Proceedings of IEEE Power System Technology, Hangzhou. 1-8.

[2] Ministry of New and Renewable Energy, Government of India. www.mnre.gov.in.

[3] Kanse-Patil, A. B., Saini, R. P, and Sharma, M. P. 2010. Integrated renewable energysystems for off grid rural electrification of remote area. Renewable Energy. 35(6), 1342-1349.

[4] Setiawan, A. A., Zhao, Y., and Nayar, C. V. 2009. Design, economic analysis and environmental considerations of mini-grid hybrid power system with reverse osmosis desalination plant for remote areas. Renewable Energy. 34(2), 374-383.

[5] Akella, A. K., Sharma. M. P., and Saini, R. P. 2007. Optimum utilization of renewable energy sources in a remote area. Renewable and Sustainable Energy Reviews. 11(5), 894-908.

[6] Rajoriya, A., and Fernandez, E. 2010. Sustainable energy generation using hybrid energy system for remote hilly rural area in India. International Journal of Sustainable Engineering. 3(3), 219-227.

[7] Asrari, A., Ghasemi, A., and Javidi, M. H. 2012. Economic evaluation of hybrid renewable energy systems for rural electrification in Iran- a case study. Renewable and Sustainable Energy Reviews. 16(5), 3123-3130.

 S-JPSET : Vol. 10, Issue 2, ISSN : 2229-7111 (Print) and ISSN : 2454-5767 (Online)

S-JPSET : Vol. 10, Issue 2, ISSN : 2229-7111 (Print) and ISSN : 2454-5767 (Online)