

# Review Paper on Three in One Generator

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**Abstract**— In entire world the non-renewable energy source, for example, coal, petrol, diesel are non-renewable, that they drawn from limited assets and they are lessened because of that reasons we have to get some sustainable power sources from where we can create the power. Some inexhaustible sources like sun oriented, wind and water we can consider as an innovative alternative for creating clean vitality. This paper speaks to the sun based, wind and pressure driven cross breed three out of one vitality generator. These three of every one generator framework is helpful are reasonable for industry and furthermore residential zones.

**Keywords:** Three in One Generator, Solar Power Generation, Wind Energy

## I. INTRODUCTION

Energy is one of the most fundamental elements of our Universe and vital for the progress of any nation. It is inevitable for survival and indispensable for development activities to promote education, health, transportation and infrastructure for attaining a reasonable standard of living and is also a critical factor for economic development and employment. It is an ultimate factor responsible for development of agriculture and industrial in a country like India. Power consumption is steadily increasing for past few years. Power utilities in many countries around the world are diverting their attention towards more energy efficient and renewable electric power sources. Generation of power through any standalone energy system cannot meet the requirements. So there is a need to correlate different types of energy systems to supply the economical and reliable power. Such generating system is known as “Hybrid Power Systems”. The needs for hybrid power system are

- 1) Excess grazing of traditional fuels like coal, gas, diesel, petrol etc.
- 2) However to the nuclear power stations many precautions are to be taken to lessen the risk occurrence in environment.
- 3) Over 200 million people living in 80,000 villages of India Three In One Renewable Energy Generator were electrified due to problems in locations, transmission economy, running and installation cost.
- 4) As to optimize the capital resources in country like India hybrid power systems are to be installed.

## II. OBJECTIVES

The reason for developing the three in one electricity generator from renewable energy sources is only that this setup will come in use at every time in the year or can be used in any season. Because solar power will work in summer season, wind power will work in winter season, and hydro-electric power setup will work in rainy season. Such as in all seasons this setup will work and at every time it will produce electric energy. Wind turbine is made to capture the maximum of wind energy in any direction by placing it at optimum place and by considering both the cost and safety of

the system. This system can be used in huge number to generate the huge amount of useful electrical energy. This energy can be stored and transferred to nearest rural places where we can fulfill the demand of electricity. The thought of design directs us to look into the various aspects such as manufacturing, noise, cost which leads us to our additional aim of analyzing the system to overcome the usual technical glitches. The project brief involves the design of a small scale wind turbine that can be easily mass produced and fitted on every highway medians to aid electricity consumption

- 1) To meet the increasing demand of water.
- 2) To reduce the run-off which chokes the drains.
- 3) To avoid the flooding of roads.
- 4) To raise the underground water table.
- 5) To reduce groundwater pollution.
- 6) To reduce soil erosion.
- 7) Supplement domestic water needs.
- 8) To reduce the operating cost.
- 9) To generate the power in any season.

## III. METHODOLOGY

In our present study planning to develop a hybrid power generation model consists of Rain water power, Solar PV and Wind energy, the process of working and installation as below:

### A. Rain Water Power:

Rainwater harvesting is the accumulation and deposition of rainwater for reuse before it reaches the aquifer. In this technique, we channel the water falling on roof tops of buildings and homes, and open spaces to a storage tank through a filter. Excess water is directed to a well or pit through which water seeps in earth to increase water table.

The techniques of rain water harvesting can be classified as

- Roof top rain water harvesting system
- Surface runoff rain water harvesting system

### 1) Solar PV Energy:

Solar panels are the medium to convert solar energy into the electrical energy fig.1 Solar panels can convert the energy directly or heat the water with the induced energy. Photovoltaic is known as the process between radiation absorbed and the electricity induced. Solar power is converted into the electric power by a common principle called photo electric effect. The solar cell array or panel consists of an appropriate number of solar cell modules connected in series or parallel based on the required current and voltage. PV (Photo-voltaic) cells are made up from semiconductor structures as in the computer technologies. Sun rays are absorbed with this material and electrons are emitted from the atoms which activates a current as shown in fig.2. Storage batteries provide the backup power during cloudy weather to store the excess power or some portion of power from the solar arrays. This solar power generating system is used for domestic power consumption,

meteorological stations and entertainment places like theatre, hotel, restaurant etc.

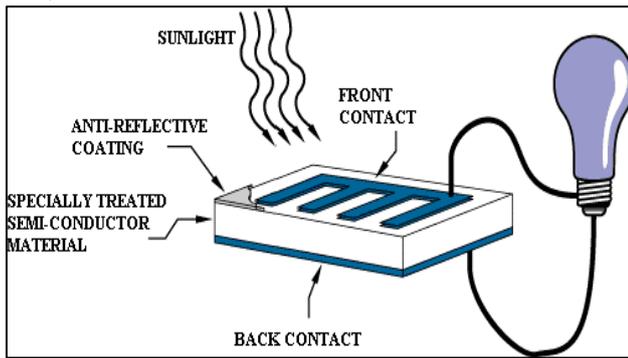


Fig. 1: Solar Power Generation

2) Wind Energy:

Wind is the flow of atmospheric air in accordance with temperature, which carries enormous quantity of energy. The wind generator units convert wind power into electrical power as shown in fig.2. The wind passes through the propeller and producing the circumferential force and axial thrust. This circumferential force is also known as torque, which drives the generator to produce the electrical power.

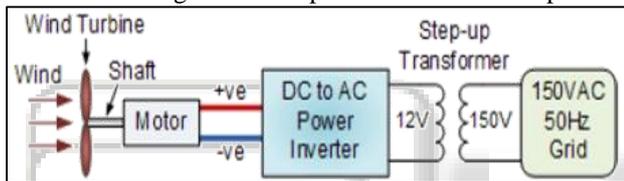


Fig. 2: Wind Power Generation

The wind velocity is a variable quantity, both in magnitude and in direction. This variable feature of wind turbine power generation is different from conventional fossil fuel, nuclear or hydroelectric power systems. Wind energy has become the least expensive renewable energy technology in existence. The greatest advantages of electricity generation from wind are that, it is renewable, eco-friendly and needs less maintenance. Wind is available in abundance, possibly everywhere in the world and it will not get depleted with use. The power in the wind is directly proportional to the area of the wind turbine swept by the wind and also to the cube of the velocity of the wind. A simple expression for the power that can be harnessed from the wind is given by equation (1)

$$P = 1/2 \rho A V^3 \quad (1)$$

Where,  $P$  = density of air and is taken as 1.225 kg/ m<sup>3</sup>

$A$  = Area of the wind turbine swept by the wind

$V$  = is the velocity of the wind

3) Experimental Setup

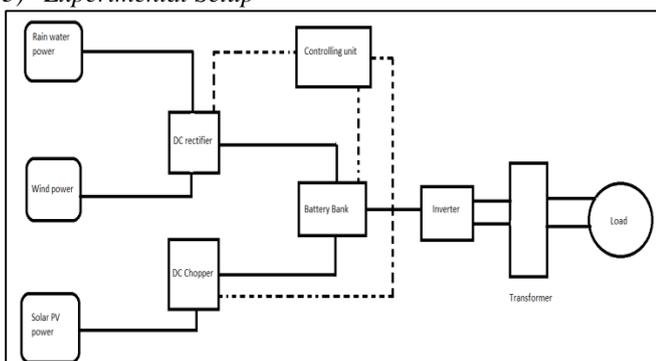


Fig. 3: Layout of Three in One Generator

In our study we are using following power electronics devices for energy type conversions and voltage level transfers as shown in fig.3. They are:

- 1) Chopper: It is used to obtain variable DC voltage from fixed DC voltage source.
  - 2) Rectifier: It is to convert the AC form of energy into DC form.
  - 3) Inverter: It is to convert the DC form of energy into AC form.
  - 4) Cycle converter: It converts the constant AC energy into variable AC energy.
  - 5) Transformer: It transfers the level of voltage i.e. from low to high or vice- verse without changing frequency.
- Controlling unit: It is used to integrate all the energy different sources and controlling all the components in the hybrid power system.

IV. CONCLUSION

Obviously, a complete hybrid power system of this nature may be too expensive and too labor intensive for many Industrial Technology Departments. Wind, Solar PV, Biomass and Rain water power generations are viable options for future power. Hybrid combinations of wind power, solar power, geothermal power, hydroelectric power, tidal power, biomass generated power, power from incineration of solid wastes, and many other technologies could be considered depending on local interests and resources. Besides being pollution free, they are free recurring costs. They also offer power supply solutions for remote areas, not accessible by the grid supply. Hybrid systems can address limitations in terms of -

- 1) Fuel Flexibility
- 2) Efficiency
- 3) Reliability
- 4) Emissions
- 5) Economics

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