

Implementation of Solar-Hydro Hybrid Power Utilization

Prateek Manjunath Naik¹, Sujithraj Y², Pradeep K Borannavar³, Sudarshan M S⁴

^{1,2,3,4}Students, Dept. of EEE, Yenepoya Institute Of Technology, Moodbidri, India-574225

Abstract: In this Research hydro power and solar power is used as the main source of energy for the generation of electricity were hydro which is clean fuel source means it won't pollute environment like those which burn fossil fuel such as coal or natural gas for generation of electricity were in addition the hydro power has additional benefits like flood control, irrigation and water supply. As we know that some part of India has heavy rainfall so we need to make proper use of running water which flows on the streets. The major problem during rainy season is that, there will be no electricity due to lighting and other issues. Hence the street lights will not will illuminated the main purpose of these project is to make sure that street light kept on during night with a help of hydro power as well as solar power This device also finds its application in village areas where it is difficult to take electric lines and also can be used in emergency situations like floods.

Keywords: Hybrid energy, solar and hydro hybrid, use of renewable energy for villages, utilization of renewable energy, Energy generation for smart village.

I. INTRODUCTION

The Renewable energy is useful energy which is collected through renewable resources. There are many source of renewable energy but the main sources are hydro energy and solar energy. Hydro energy means the form of energy that harnesses the power of water in motion—such as water flowing over a waterfall—to generate electricity generation. The people have been using this technology for millennia. Another source is solar energy means radiant heat and light from sun is captured by using many devices like photovoltaic and many other. Hybrid energy means combining any two source of energy to produce power. The hybrid power generation systems will in turn be used for charging the batteries. The Hybrid (Wind / hydro / solar) system is more economical, environmental friendly. The power generation capacity of hybrid system is more than the power generation capacity of the individual system. The results showing the power output of individual system and hybridized system obtained from Metrological Station is used for comparison between the different hybrid systems. Archimedes screw generators (ASGs) are beginning to be widely adopted at low head sites in some places of the world due to high efficiency, low environmental impact. This technology of Archimedes screws are a recent addition to the available range of micro hydro generation technologies. Compared to other generation technologies, ASGs have greatest potential at low head sites (less than about 5 m), and unlike conventional reaction or impulse turbines, have the potential for maintaining high efficiencies even as the head approaches.

II. METHODOLOGY

A. Working

The system consists of multiple power generation sources connected to form a hybrid system. For the power generation from the flowing water, an Archimedes screw principle is being used. An Archimedes screw consists of an inner cylindrical shaft, around which one or more helical surfaces (flights) are wrapped orthogonal to the cylinder surface. The resulting geometry is very much like a conventional screw. The screw sits in (and in some cases has fixed to it) a cylindrical trough. This trough may be a tube that encircles the screw, or it may only extend around the lower half of the screw. When used as a pump, an Archimedes screw is rotated, which traps water between two consecutive flights. This body of water is called a 'bucket' and is raised along the trough as the screw turns. ASGs operate in reverse: water flows into the top of the screw, causing it to turn. As with pumping, the water is bounded by two consecutive flights in a

'bucket'. The hydrostatic pressure this body of water exerts on the bucket surfaces causes the screw to turn, lowering the bucket in the process. The screw is interconnected to the dynamo which in-turn produces the energy when the water flows.

The system also has a Solar Panel which can produce high energy throughout a hot day. The energy produced by these two sources is being monitored by a microcontroller through voltage sensors and are stored in a Lead-acid battery. The stored energy can be used to power the street light during night time and also for any rural applications where there is scarcity of power. The system shows the energy produced by each sources and values are displayed on the LCD.

The system also has a Light sensor connected to a voltage comparator, which can control the street lights automatically during day and night and hence avoiding wastage of power because of unnecessary usage of street lights.

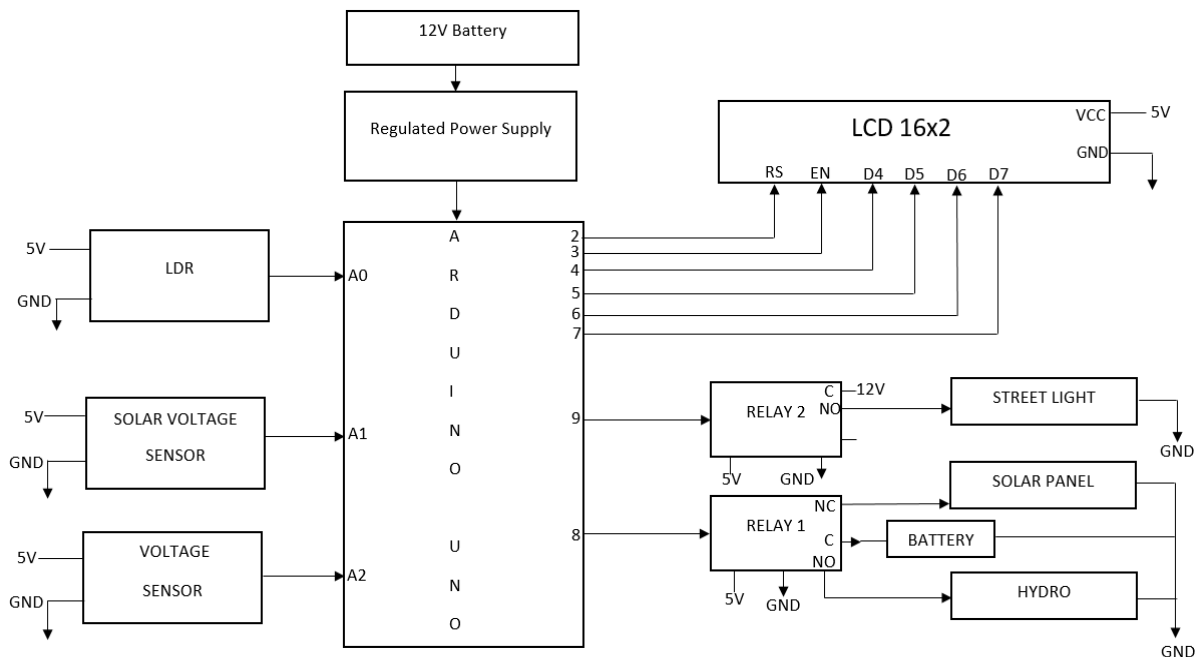


FIGURE 1: BLOCK DIAGRAM OF SYSTEM

III. ADVANTAGES

There are many advantages of the system as it is form of renewable energy there will be continuous flow of electricity and this system can be used as emergency source of electricity in case of disaster like flood. It can be easily transported and this system helps in maximum conservation of energy from different sources.

IV. APPLICATION

Micro hydro power generator can be used for emergency source of electricity. It also can be used for street light in rural areas and the stored energy can be utilized for street lights, pumping waters etc. This system can be upgraded using solar tracking technique to utilize maximum amount of solar energy in a whole day which can be installed in any locations.

V. FUTURE SCOPE

Used to help rural areas where there is shortage electricity and this system can be implemented were electric lines can't reach and Used to develop rural areas since it is eco-friendly and cost effective

VI. CONCLUSION

As India has high capacity of renewable energy source so that it can provide electricity to many surrounding community the possibility of hydro flow in irrigation canals also from the hybrid model, which consists of a micro-hydro system that is designed, the production of electrical energy can be used to meet the electrical energy needs for the electricity.

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